West Coast Vancouver Island Groundfish Bottom Trawl Survey, May 26th to June 22nd, 2008

N. Olsen, K.L. Rutherford, R.D. Stanley, and M.R. Wyeth

Fisheries and Oceans Canada
Science Branch, Pacific Region
Pacific Biological Station
Nanaimo, BC
V9T 6N7

2009

Canadian Manuscript Report of Fisheries and Aquatic Sciences 2902

Fisheries and Oceans | Pêches et Océans

Canada

Canadian Manuscript Report of Fisheries and Aquatic Sciences

Manuscript reports contain scientific and technical information that contributes to existing knowledge but which deals with national or regional problems. Distribution is restricted to institutions or individuals located in particular regions of Canada. However, no restriction is placed on subject matter, and the series reflects the broad interests and policies of Fisheries and Oceans Canada, namely, fisheries and aquatic sciences.

Manuscript reports may be cited as full publications. The correct citation appears above the abstract of each report. Each report is abstracted in the data base *Aquatic Sciences and Fisheries Abstracts*.

Manuscript reports are produced regionally but are numbered nationally. Requests for individual reports will be filled by the issuing establishment listed on the front cover and title page.

Numbers 1-900 in this series were issued as Manuscript Reports (Biological Series) of the Biological Board of Canada, and subsequent to 1937 when the name of the Board was changed by Act of Parliament, as Manuscript Reports (Biological Series) of the Fisheries Research Board of Canada. Numbers 1426 - 1550 were issued as Department of Fisheries and Environment, Fisheries and Marine Service Manuscript Reports. The current series name was changed with report number 1551.

Rapport manuscrit canadien des sciences halieutiques et aquatiques

Les rapports manuscrits contiennent des renseignements scientifiques et techniques qui constituent une contribution aux connaissances actuelles, mais qui traitent de problèmes nationaux ou régionaux. La distribution en est limitée aux organismes et aux personnes de régions particulières du Canada. Il n'y a aucune restriction quant au sujet; de fait, la série reflète la vaste gamme des intérêts et des politiques de Pêches et Océans Canada, c'est-à-dire les sciences halieutiques et aquatiques.

Les rapports manuscrits peuvent être cités comme des publications à part entière. Le titre exact figure au-dessus du résumé de chaque rapport. Les rapports manuscrits sont résumés dans la base de données *Résumés des sciences aquatiques et halieutiques.*

Les rapports manuscrits sont produits à l'échelon régional, mais numérotés à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page du titre.

Les numéros 1 à 900 de cette série ont été publiés à titre de Manuscrits (série biologique) de l'Office de biologie du Canada, et après le changement de la désignation de cet organisme par décret du Parlement, en 1937, ont été classés comme Manuscrits (série biologique) de l'Office des recherches sur les pêcheries du Canada. Les numéros 901 à 1425 ont été publiés à titre de Rapports manuscrits de l'Office des recherches sur les pêcheries du Canada. Les numéros 1426 à 1550 sont parus à titre de Rapports manuscrits du Service des pêches et de la mer, ministère des Pêches et de l'Environnement. Le nom actuel de la série a été établi lors de la parution du numéro 1551.

Canadian Manuscript Report of
Fisheries and Aquatic Sciences 2902

2009

WEST COAST VANCOUVER ISLAND GROUNDFISH BOTTOM TRAWL SURVEY, MAY 26TH TO JUNE 22ND, 2008

by

N. Olsen, K.L. Rutherford, R.D. Stanley, and M.R. Wyeth

Fisheries and Oceans Canada
Science Branch, Pacific Region
Pacific Biological Station
Nanaimo, British Columbia
V9T 6N7

©Her Majesty the Queen in Right of Canada, 2009
Cat. No. 97-4/2902E ISSN 0706-6473

Correct citation for this publication:

Olsen, N., Rutherford, K.L., Stanley, R.D., and Wyeth, M.R. 2009. West coast Vancouver Island groundfish bottom trawl survey, May 26th to June 22nd, 2008. Can. Manuscr. Rep. Fish. Aquat. Sci. 2902: vi + 50 p.

Table of Contents

Abstract v
Résumé vi
Introduction 1
Methods 2
Vessel and Fishing Gear 2
Staff Summary 2
Survey Design 2
Operations 2
Fishing 2
Gear and Oceanographic Sensors 3
Catch Processing 3
Biological Sampling 4
Results 4
Fishing 4
Catch 4
Samples and Specimens 5
Gear and Oceanographic Sensors 5
References 6
Appendix A: Bridge Log 29
Appendix B: Catch by Tow 33

List of Tables

Table 1. Net specifications 7
Table 2. Science staff on each leg of the survey. 8
Table 3. Definition of survey strata with the target tow allocation and the total area in each. 9
Table 4. Mean warp length and scope by depth interval. 9
Table 5. Summary of survey operations. 10
Table 6. Catch broken down by species groups 10
Table 7. All captured species showing number of tows in which the species occurred, total catch weight, maximum and mean per-tow catch weight, and relative abundance and relative error from bootstrapped area expanded estimates 11

Table 8. Number of samples and number of recorded biological attributes per species sampled. 17

Table 9. Numbers of samples and specimens by sample type and species..... 18

Table 10. Statistics of individual length and weight, and sex proportion by species. 19

Table 11. Data collected from net sensors, showing the number of tows from which each data type was collected. 20

List of Figures

Figure 1. Locations of the modern groundfish trawl surveys on the coast of British Columbia, Canada. HS = Hecate Strait; WCQCI = west coast of Queen Charlotte Islands; QCS = Queen Charlotte Sound; WCVI = west coast of Vancouver Island. 21

Figure 2. The Canadian Coast Guard Ship W.E. Ricker. 21

Figure 3. Design specifications for the Atlantic Western IIa box trawl used on the survey. 22

Figure 4. The Queen Charlotte Sound study area showing area boundary, sponge reef protected area, and depth contours..... 23

Figure 5. Initial status of the sampling frame showing the 121 selected fishing locations. 23

Figure 6. Example tow tracks demonstrating variations in track location within blocks.24

Figure 7. Warp length vs. starting depth..... 24

Figure 8. The paths followed on each leg of the survey. 25

Figure 9. Final status of the sampling frame showing locations that were fished successfully (completed), rejected prior to fishing (rejected), or abandoned after one or more unsuccessful fishing attempts (failed). 25

Figure 10. Histogram of number of species caught per tow. 26

Figure 11. Histogram of catch weight per tow. 26

Figure 12. Biomass indices (tonnes) of selected species from all years of the Hecate Strait survey. 27

Figure 14. Example of a Seabird 39 temperature and depth profile. The vertical lines indicate the start and end of net contact with the sea floor. 28

Figure 15. An example of an NMFS bottom contact sensor profile. The raised segment in the middle of the profile at approximately 80° indicates where the net made contact with the sea floor. 28

ABSTRACT

Olsen, N., Rutherford, K.L., Stanley, R.D., and Wyeth, M.R. 2009. West coast Vancouver Island groundfish bottom trawl survey, May 26th to June 22nd, 2008. Can. Manuscr. Rep. Fish. Aquat. Sci. 2902: vi + 50 p.

A bottom trawl survey of the west coast of Vancouver Island was conducted on the Canadian Coastguard Ship W. E. Ricker between May 26th and June 22nd, 2008. This was the third survey in what is intended to be a long-term survey series, coordinated with other area-specific surveys that together cover the continental shelf and upper slope of most of the British Columbia coast. The objective of these surveys is to provide fishery-independent abundance indices of all demersal fish species available to bottom trawling, as well as to collect biological samples of selected species.

The survey conducted 166 successful tows from a total of 179. The mean catch per successful tow was 641 kg, averaging about 21 different species of fish and invertebrates in each. The most abundant fish species encountered was arrowtooth flounder (*Atheresthes stomias*) followed by spiny dogfish (*Squalus acanthias*), splitnose rockfish (*Sebastes diploproa*), Pacific ocean perch (*Sebastes alutus*), and Dover sole (*Microstomus pacificus*). Biological data, including individual length, weight, sex, maturity, and age structure were collected from 55 different species of fish. Oceanographic data was also recorded for most tows, including water temperature, depth, salinity, dissolved oxygen, and pH.

RÉSUMÉ

Olsen, N., Rutherford, K.L., Stanley, R.D., and Wyeth, M.R. 2009. West coast Vancouver Island groundfish bottom trawl survey, May 26th to June 22nd, 2008. Can. Manuscr. Rep. Fish. Aquat. Sci. 2902: vi + 50 p.

Un relevé au chalut de fond a été réalisé du 26 mai au 22 juin 2008 le long de la côte ouest de l'île de Vancouver par le navire W.E. Ricker de la Garde côtière canadienne. Il s'agit du troisième relevé d'une série d'échantillonnages qui se veulent à long terme et qui sont coordonnés avec d'autres échantillonnages par secteur couvrant, ensemble, la plate-forme continentale et la partie supérieure du talus de la majeure partie de la côte de la Colombie-Britannique. L'objectif de ces échantillonnages est d'établir des indices d'abondance, indépendants de la pêche, de toutes les espèces de poissons démersaux capturables au chalut de fond et de recueillir des données biologiques sur les espèces sélectionnées.

Des 179 traits de chalut réalisés, 166 ont été fructueux. La prise moyenne par trait réussi pesait 641 kg. Quelque 21 espèces différentes de poissons et d'invertébrés ont été prises en moyenne à chaque trait. La plie à grande bouche (*Atheresthes stomias*) a été l'espèce la plus abondante; venaient ensuite l'aiguillat commun (*Squalus acanthias*), le bec-de-lièvre (*Sebastes diploproa*), le sébaste à longue mâchoire (*Sebastes alutus*) et la sole à petite bouche (*Microstomus pacificus*). Des données biologiques (longueur, poids, sexe, stade de maturité et structure d'âge) ont été recueillies pour 55 espèces différentes de poisson. Des données océanographiques (température de l'eau, profondeur, salinité, oxygène dissous et pH) ont également été recueillies pour la plupart des traits.

INTRODUCTION

In 2003 a report by the Pacific Scientific Advice Review Committee (PSARC) recommended development of fishery-independent relative abundance indices using bottom trawl surveys in British Columbia waters (Sinclair et al., 2003). As an initial step, it recommended that a pilot survey be conducted in PMFC major areas 5A and 5B (Queen Charlotte Sound). This region was recommended in part because it is not covered by other bottom trawl surveys and it represents a significant portion of the commercial bottom trawl fishery.

The first Queen Charlotte Sound survey was successfully completed in the summer of 2003 (Olsen et al., 2007). Following that, additional surveys were planned for the west coast of Vancouver Island beginning in 2004, Hecate Strait beginning in 2005, and the west coast of the Queen Charlotte Islands beginning in 2006. These surveys are to be conducted on a rotating biennial schedule with the Queen Charlotte Sound and Hecate Strait surveys conducted in odd-numbered years and the west coast Vancouver Island and west coast Queen Charlotte Islands surveys conducted in even-numbered years. Together they provide comprehensive coverage of the continental shelf and upper slope of the British Columbia Coast (Figure 1).

This document provides a brief synopsis of the 2008 west coast Vancouver Island groundfish bottom trawl survey, including the methods used and data collected. It is not intended as a comprehensive review of the survey, nor does it provide interpretive analysis of the survey results. Reports of the previous two west coast Vancouver Island surveys are given in Workman et al., 2008a and Workman et al., 2008b.

METHODS

VESSEL AND FISHING GEAR

The survey was conducted aboard the Canadian Coast Guard Ship CCGS W. E. Ricker (Figure 2). The trawl net used was an Atlantic Western IIA box trawl (Table 1; Figure 3) connected to 1,100 kg U.S.A. Jet doors.

STAFF SUMMARY

A total of 15 personnel were involved in the survey, which was split into 2 legs of 15 and 13 days each, respectively, with 8 staff in each (Table 2).

SURVEY DESIGN

The study area consists of the west coast of Vancouver Island, from approximately latitude 49° 12' N to latitude 50° 36' N and approximately longitude 124° 48' W to longitude 128° 30' W, covering depths from 50 to 500 meters (Figure 4), and categorized into four distinct strata (Table 3; Figure 4). The southern region of this survey is contiguous with Canada/U.S. boundary.

We divided the survey area into a contiguous grid of 4 km^2 blocks and from these blocks we randomly selected 246 fishing locations. The number of locations and the allocation of locations across strata were based on an analysis by Sinclair et al. (2003) and were intended to minimize observational error for the most important commercial groundfish species (Figure 5).

OPERATIONS

Fishing

Fishing commenced at approximately 7 AM and ended at approximately 7 PM each day, to coincide with the ship's 12 hour crew rotation schedule.

Prior to fishing, the fishing master and chief scientist reviewed the selected fishing locations to determine a candidate set of locations to visit throughout the day. During this review process the fishing master would sometimes determine, based on his experience and knowledge of an area, that one or more locations were not fishable. In such cases we would mark the locations as "rejected based on prior knowledge".

We frequently began fishing immediately on arrival at a fishing location. However, if the fishing master was not familiar with an area we would "sound" the region (traverse the location and examine the depth sounder trace) to determine if it was suitable for trawling. If it was not, we marked the location and "rejected based on inspection".

When trawling, the fishing master would attempt to tow through the center of the 4 km^2 fishing block, usually following a depth contour. However, where the bottom topography made this difficult or impossible, the fishing master would trawl wherever he felt he could obtain a successful result, with the stipulation that at least half of the total

trawl track had to be within the 4 km^2 block (Figure 6). The scope used in 2009 is shown in Table 4 and Figure 7.

To determine the start of each 20 minute tow, we monitored the real-time net sensor data to establish when the net reached the sea floor, at which point we considered the net to be actively fishing. Nineteen minutes after the start of the tow, we retrieved the net. Retrieval was done one minute early because slack in the warps creates a lag of about one minute before the net leaves the bottom. Although our target on-bottom time was 20 minutes, we accepted tows that were at least 15 minutes in length. This was a pragmatic decision that allowed us to retain many tows that would otherwise have been failures due to hang-ups or early haul-backs.

The result of trawling was either a successful tow, or a hang-up or tear-up of the trawl net. In the event of a hang-up or tear-up, we would either mark the location as "rejected after one or more attempts to fish" or make additional attempts to fish. Thus, we kept records of the three scenarios that resulted in a location being removed from the sampling frame:

- Rejection based on prior knowledge
- Rejection based on on-ground inspection
- Rejection based on one or more failed fishing attempts

Rejected locations were removed from the sampling frame for the current and all future surveys. Thus, every year of the survey results in the removal of some unfishable area, which over time, will lead to increasing efficiency (i.e. we will spend less time surveying areas that cannot be fished).

Gear and Oceanographic Sensors

The trawl net was equipped with a Simrad ITI Trawl System that provided real-time net depth, doorspread and wingspread values. These data allowed us to continually monitor the net during fishing. In addition to these real-time sensors, we also attached data-logging probes to collect water temperature and pressure/depth (Seabird SBE 39), dissolved oxygen, pH, salinity, temperature, and depth (Seabird SBE 19plus), and contact of the trawl net with the sea floor (NMFS Bottom Contact Sensor). Data from these logging probes were downloaded at the end of each day.

Catch Processing

At the end of each tow, the net was retrieved and the catch dumped into a hopper in the fish processing lab. Catch was sorted by species into separate baskets as it moved along a conveyor system. Baskets were weighed to the nearest 0.1 kg using a large capacity, motion-compensating electronic balance (Marel Model M1100/M2000, 60 kg capacity). For small catches the number of individuals was often recorded as well as the weight. Catch was sorted to the lowest taxonomic group possible. For most fishes this was to the level of species; invertebrates, however, were often only keyed to phylum or order.

Biological Sampling

While the primary purpose of this survey was to generate fishery independent indices of relative abundance, our second goal was to collect associated biological information on the size, sex, and age composition of selected species. In particular, our biological sampling priorities were to collect length and sex frequencies on all species in the catch of each tow (subject to a minimum number of specimens criteria), to collect representative samples of specimen length and weight, and to collect age samples for select species.

We selected age samples from the dominant (by weight) catch in each tow, as well as certain species deemed high priority due to concerns over stock status (for example, Bocaccio, lingcod, and Pacific cod). Otoliths (calcareous accretions of the inner ear) were collected from rockfish and flatfish species while fin clips were taken from lingcod and Pacific cod. Both of these structures grow in a series of annular rings that can be counted to determine age.

RESULTS

FISHING

We divided the survey into 2 legs of 15 and 13 days each. The overall pattern of vessel movement during each leg is shown in Figure 8.

From a total of 28 survey days, 2 days were required for travel at the start and end of the survey and 2 days were required for crew changes. Thus, we ended with a total of about 24 full fishing days, in which time we conducted 179 tows, of which 166 were successful and 13 were unsuccessful due to hang-ups or tear-ups, for an average of about 7 successful tows per fishing day (Table 5).

The final status of the 2009 sampling frame includes 166 successfully fished locations , 28 locations rejected either prior to fishing, based on the fishing master's knowledge, or based on on-ground inspection, and 6 locations rejected after one or more failed fishing attempts (Figure 9).

CATCH

Catch weight per tow was typically less than 2,000 kg and on average, we observed about 15 to 30 species per tow (Figure 10 and Figure 11). We caught a total of 108,216 kg of fish and invertebrates. Most of this (107,895 kg) consisted of 103 different taxonomic groups of fish, including 27 rockfish taxa and 13 flatfish taxa. The remainder (321 kg) consisted of 85 invertebrate groups (Table 6). Of the fish species, arrowtooth flounder (*Atheresthes stomias*) was the dominant by weight, followed by spiny dogfish (*Squalus acanthias*), splitnose rockfish (*Sebastes diploproa*), Pacific ocean perch (*Sebastes alutus*), and Dover sole (*Microstomus pacificus*) (Table 7). Biomass indices over the history of the survey (2004, 2006, and 2008) are shown for selected species in Figure 12.

SAMPLES AND SPECIMENS

We sampled 55 species of fish for attributes such as length, weight, sex, maturity, and age (Table 8, Table 9, and Table 10).

GEAR AND OCEANOGRAPHIC SENSORS

We collected Seabird 39 data (water temperature and depth) from 158 tows and Seabird 19plus data (water temperature, depth, pH, salinity, and dissolved oxygen from 150 tows (Table 11, Figure 13). Although we have not yet analyzed these data in detail, they may prove useful for explaining, or at least correlate to, short term anomalies in abundance trends. In addition, they provide a base reference for detecting future climate change.

We collected bottom contact data from the NMFS Bottom Contact Sensor from 151 tows (Table 11). These data provide a record of the trawl net contact with the sea floor and thus are useful not only for determining the quality and quantity of the sea floor contact, but also indicate the relative rugosity of the sea floor. We use these data to determine the exact times that the trawl net first and last contacts the sea floor, thus providing an accurate measure of total bottom contact time (Figure 14).

REFERENCES

Olsen, N., Workman, G. D., and Stanley, R. D. 2007. Queen Charlotte Sound groundfish bottom trawl survey July 3rd to August 10th, 2003. Can. Manuscr. Rep. Fish. Aquat. Sci. 2782: 58 p.

Sinclair, A., Schnute, J., Haigh, R., Starr, P., Stanley, R. D., Fargo, J., and Workman, G. 2003. Feasibility of multispecies groundfish bottom trawl surveys on the BC coast. Can. Stock Assess. Sec. Res. Doc. 2003/049.

Workman G. D., Olsen, N., Fargo, J., and Stanley, R.D. 2008a. West coast Vancouver Island groundfish bottom trawl survey, R/V WE RICKER, May 25th to June 10th, 2004. Can. Manuscr. Rep. Fish. Aquat. Sci.2826: 70 p.

Workman G.D., Olsen, N., Fargo, J., and Stanley, R.D. 2008b. West coast Vancouver Island groundfish bottom trawl survey, R/V WE RICKER, May 23rd to June 19th, 2006. Can. Manuscr. Rep. Fish. Aquat. Sci.2841: viii + 83 p.

Table 1. Net specifications.

Part	Standard Length	Material	Metric Length	Units	Material
Rigging					
Sweep Line	90	7/8 cable	27.4	m	22 mm cable
Upper bridle	90	3/4 cable	27.4	m	19 mm cable
Lower bridle	90	7/8 cable	27.4	m	22 mm cable
Door Legs	36	7/8 cable	11	m	22 mm cable
Pickups	42	7/8 cable	12.8	m	22 mm cable
Hook ups	8.8 t	BMMDV80	8 mt	mt	BMMDV80
Net frame					
Headline	74.5	5/8 cable	22.7	m	16 mm cable
Headline floats	90	8" plastic Spheres			200 mm plastic spheres
Riblines		1" Polysteel rope			25 mm polysteel rope
Bolsch Line	68.33	9/8" poly steel rope	20.8	m	29 mm polysteel rope
Fishing Line	107.33	14 mm long link chain	32.7	m	14 mm long link chain
Foot Rope					
Foot Rope	107.33	5/8 Chain	32.7	m	16 mm chain
Foot rope bosom	14	16 in Tire gear with 2 in Spacing	4.3	m	400 mm tire gear with 50 mm spacing
Root rope wing1	18.33	18" rock hopper, 18 " disks spaced 18 " apart	5.6	m	450 mm rock hopper 450 mm spacing
Root rope wing2	8.83	18" rock hopper, 18 " disks spaced 18 " apart	2.7	m	450 mm rock hopper 450 mm spacing
Web					
Belly	5"	3.5 mm Euroline	127	mm	3.5 mm Euroline
Square	5"	3.5 mm Euroline	127	mm	3.5 mm Euroline
Side Panel	5"	3.5 mm Euroline	127	mm	3.5 mm Euroline
Taper	4.5"	3.5 mm Euroline	114	mm	3.5 mm Euroline
Intermediate	4.5"	3.5 mm Euroline	114	mm	3.5 mm Euroline
Codend	4.5"	3.5 mm Euroline	114	mm	3.5 mm Euroline
Guard Mesh	4.5 or 5 "	Double 4.5 mm Euroline	114 or 127	mm	Double 4.5 mm Euroline
Liner	3/4"	Notless Nylon	19	mm	Notless Nylon

Table 2. Science staff on each leg of the survey.

Leg	Dates	Staff
1	May 26th to June 10th	Ken Barabash Andrew Edwards Adam Kieser Rob Kronlund Tim Norris Norm Olsen Greg Workman * Malcolm Wyeth **
3	June 11th to June 23rd	Scott Anderson Jeff Fargo * Brian Krishka Matt McKay Tim Norris Kate Rutherford ** Greg Workman Malcolm Wyeth

* Chief scientist

** Lab boss

Table 3. Definition of survey strata with the target tow allocation and the total area in each.

Depth		Target Tow	Actual Tow	Usable	Area
Meters	Fathoms	Allocation	Allocation	Tows	(km^2)
50 - 125	27 - 68	70	98	54	7,012
125 - 200	68 - 109	60	74	51	4,313
200 - 330	109 - 180	35	42	36	804
330 - 500	180 - 273	25	32	25	789
Totals		**190**	**246**	**166**	**12,918**

Table 4. Mean warp length and scope by depth interval.

Depth (m)	Mean Warp (m)	Mean Warp (fa)	Mean Scope	Mean Depth (fa)
50 - 100	237	129	3.0	44
100 - 150	345	189	2.8	68
150 - 200	477	261	2.8	93
200 - 250	583	319	2.6	122
250 - 300	783	428	2.9	149
300 - 350	845	462	2.6	178
350 - 400	843	461	2.3	203
400 - 450	965	528	2.3	233
450 - 500	900	492	2.0	252

Table 5. Summary of survey operations.

Date	Start Fishing	End Fishing	Hours Fishing	Successful Tows	Failed Tows	Total Tows	Travel Day	Crew Change
5/26/2008	-	-	-	-	-	-	✓	
5/27/2008	8:19	18:27	10	7	0	7		
5/28/2008	13:51	19:40	6	4	2	6		
5/29/2008	7:16	19:14	12	9	0	9		
5/30/2008	7:16	15:40	8	5	1	6		
5/31/2008	9:54	18:48	9	6	1	7		
6/1/2008	8:25	16:04	8	5	1	6		
6/2/2008	7:36	18:44	11	9	0	9		
6/3/2008	7:36	19:17	12	8	1	9		
6/4/2008	7:21	17:32	10	8	0	8		
6/5/2008	7:49	15:03	8	7	0	7		
6/6/2008	7:23	18:47	11	8	0	8		
6/7/2008	7:20	18:52	11	9	1	10		
6/8/2008	7:14	19:16	12	12	0	12		
6/9/2008	7:13	12:25	5	4	0	4		
6/10/2008	-	-	-	-	-	-		✓
6/11/2008	10:37	19:17	9	6	1	7		
6/12/2008	7:27	14:20	7	4	0	4		
6/13/2008	7:18	17:05	10	6	1	7		
6/14/2008	12:23	19:20	7	5	0	5		
6/15/2008	7:31	18:54	11	9	0	9		
6/16/2008	7:20	18:16	11	9	0	9		
6/17/2008	-	-	-	-	-	-		✓
6/18/2008	7:23	18:27	11	9	0	9		
6/19/2008	7:13	17:50	10	8	1	9		
6/20/2008	7:08	18:32	11	4	3	7		
6/21/2008	7:13	15:41	8	5	0	5		
6/22/2008	-	-	-	-	-	-	✓	
Total			**228**	**166**	**13**	**179**	**2**	**2**
Average Per Day			**9.5**	**6.9**	**0.5**	**7.5**		

Note: June 17 crew change was to pick up Malcolm Wyeth in Port Alberni

Table 6. Catch broken down by species groups.

Species Category	Number of Taxa	Weight (kg)
All fish	103	107,895
Rockfish	27	36,892
Flatfish	13	42,278
Roundfish	9	4,694
Cartilaginous fish	7	23,700
Other fish	47	331
Invertebrates	85	321
All Species	188	108,216

Table 7. All captured species showing number of tows in which the species occurred, total catch weight, maximum and mean per-tow catch weight, and relative abundance and relative error from bootstrapped area expanded estimates.

Species	Number of Tows	Catch Weight (kg) Total	Maximum	Mean	Biomass (tonnes)	Relative Error
Arrowtooth flounder	164	25,393.7	8,407.5	154.8	7,963.2	0.29
Spiny dogfish	140	18,904.1	6,000.0	135.0	14,866.8	0.38
Splitnose rockfish	50	7,895.3	1,092.1	161.1	1,653.9	0.23
Pacific ocean perch	69	7,066.7	651.3	102.4	1,642.2	0.18
Dover sole	161	6,443.8	328.9	40.3	2,590.2	0.10
Yellowtail rockfish	69	5,226.6	1,627.2	75.7	4,570.8	0.48
Rex sole	167	5,134.8	179.9	30.7	3,401.4	0.09
Redstripe rockfish	34	4,612.6	1,595.8	135.7	2,793.3	0.45
Sharpchin rockfish	57	3,768.8	705.1	66.1	989.5	0.24
Spotted ratfish	155	3,218.5	721.2	20.8	3,510.7	0.35
Greenstriped rockfish	95	2,133.2	315.4	22.5	1,155.9	0.23
Sablefish	94	1,836.7	275.5	19.5	517.8	0.14
Longnose skate	101	1,392.2	71.5	13.8	723.8	0.13
English sole	97	1,305.4	99.7	13.5	1,280.9	0.14
Pacific hake	70	1,153.7	296.5	16.7	265.9	0.27
Canary rockfish	57	1,148.5	163.2	20.1	833.7	0.27
Pacific sanddab	48	1,129.4	121.0	23.5	1,305.8	0.22
Shortspine thornyhead	57	1,086.4	183.9	19.1	255.9	0.19
Silvergray rockfish	53	1,017.7	212.7	19.2	358.3	0.21
Lingcod	90	996.3	52.2	11.1	729.5	0.11
Pacific halibut	89	812.2	34.8	9.1	614.0	0.13
Flathead sole	50	755.9	177.5	15.4	686.6	0.29
Rougheye rockfish	35	745.2	200.6	21.3	162.0	0.29
Petrale sole	99	716.7	62.8	7.2	641.1	0.15
Pacific cod	69	641.8	173.4	9.3	613.0	0.39
Redbanded rockfish	66	408.5	34.2	6.2	96.4	0.16
Slender sole	136	362.5	22.9	2.8	289.7	0.12
Bocaccio	50	313.5	58.4	6.3	171.0	0.28
Darkblotched rockfish	41	309.6	63.3	7.6	78.4	0.25
Rosethorn rockfish	49	308.1	72.7	6.3	124.2	0.36
Shortraker rockfish	9	262.9	124.4	29.2	70.3	0.46
Yelloweye rockfish	22	246.9	47.4	11.2	168.1	0.33
Yellowmouth rockfish	8	210.8	160.8	26.4	41.1	0.68
Southern rock sole	21	184.2	47.9	8.8	249.3	0.40
Big skate	6	122.0	58.5	20.3	139.6	0.57
Bigfin eelpout	44	71.0	7.2	1.7	15.9	0.17
Quillback rockfish	8	59.2	18.6	7.4	71.2	0.45
Eulachon	54	58.6	6.2	1.2	59.0	0.20
Fragile urchin	68	55.2	9.8	1.1		
American shad	14	54.6	42.5	3.9	47.4	0.83
Pink shrimp (smooth)	44	53.4	9.1	1.5		
Sandpaper skate	29	45.1	5.0	1.6	16.6	0.19
Blackbelly eelpout	57	43.6	11.7	1.1	42.1	0.33
Pacific herring	24	39.9	7.8	1.7	42.2	0.38

Table 7. Continued

Species	Number of Tows	Catch Weight (kg) Total	Maximum	Mean	Biomass (tonnes)	Relative Error
Threadfin sculpin	72	37.4	7.1	0.6	28.0	0.32
Widow rockfish	13	36.9	12.4	2.8	17.9	0.55
Pacific tomcod	10	36.7	11.2	3.7	32.2	0.46
Curlfin sole	15	32.7	7.3	2.2	38.5	0.37
Prawn	42	26.9	3.2	0.7		
Whitespotted sea cucumber	45	21.2	6.1	0.5		
Sponges	19	19.8	3.8	1.4		
Metridium	14	18.6	6.7	1.3		
Heart urchins	39	18.0	8.5	0.6		
Schoolmaster gonate squid	11	17.2	4.2	1.6		
Pygmy rockfish	16	16.0	2.5	1.0	7.4	0.36
Sand star	25	13.6	3.1	0.7		
Anemone	26	12.7	4.2	0.6		
Brown cat shark	9	10.6	2.7	1.2	2.9	0.34
Grooved tanner crab	6	10.2	4.6	1.7		
Aurora rockfish	9	8.3	2.2	0.9	2.4	0.41
Walleye pollock	18	8.2	2.7	0.5	8.1	0.43
Black eelpout	16	8.1	3.1	0.7	1.9	0.36
Giant grenadier	1	7.7	7.7	7.7	2.2	0.94
Aleutian skate	1	7.4	7.4	7.4	1.4	0.95
Kelp greenling	6	6.9	2.0	1.1	7.5	0.50
Stripetail rockfish	4	6.4	4.8	1.6	1.9	0.60
Wolf eel	2	6.3	4.4	3.1	8.7	0.73
Sidestripe shrimp	34	5.6	1.7	0.3		
Starry flounder	2	5.6	3.1	2.8	7.5	0.71
Prowfish	1	5.5	5.5	5.5	4.1	0.97
Chinook salmon	1	5.0	5.0	5.0		
Sunflower starfish	5	4.9	2.0	1.2		
Sea whip	36	4.9	0.9	0.2		
Giant red sea cucumber	6	3.3	1.0	0.6		
Pink shrimp	7	2.9	1.8	0.7		
Flapjack devilfish	2	2.8	1.7	1.4		
Hippasteria californica	5	2.5	1.8	0.5		
Shortbelly rockfish	2	2.4	2.0	1.2	1.7	0.82
Basket stars	13	1.8	0.4	0.2		
Hippasteria	3	1.7	0.8	0.6		
Basket star	8	1.6	0.6	0.2		
Yellowtail	1	1.5	1.5	1.5	0.3	0.94
Solasteridae	4	1.5	1.2	0.5		
Jellyfish	8	1.4	0.6	0.2		
Spiny red sea star	4	1.4	1.2	0.5		
Sea cucumbers	4	1.3	0.7	0.3		
Pink short-spined star	1	1.2	1.2	1.2		
Vermilion rockfish	1	1.2	1.2	1.2	1.5	0.97

Table 7. Continued

Species	Number of Tows	Catch Weight (kg) Total	Maximum	Mean	Biomass (tonnes)	Relative Error
Soft sea cucumber	6	1.2	0.4	0.2		
Fish-eating star	9	1.2	0.3	0.1		
Snake prickleback	3	1.2	0.5	0.4	1.6	0.55
Starfish	10	1.2	0.5	0.1		
Glass sponges	2	0.8	0.8	0.8		
Gonate squids	1	0.8	0.8	0.8		
Butter sole	3	0.8	0.6	0.3	0.2	0.77
Oregontriton	12	0.7	0.3	0.1		
Leather star	1	0.7	0.7	0.7		
Lithodes couesi	1	0.7	0.7	0.7		
Smoothskin octopus	1	0.7	0.7	0.7		
Greenspotted rockfish	1	0.5	0.5	0.5	0.7	1.06
Sea mouse	6	0.5	0.2	0.1		
Hagfishes	1	0.5	0.5	0.5		
Ophiuridae	8	0.5	0.3	0.3		
Morning sun starfish	5	0.5	0.2	0.2		
Dungeness crab	1	0.5	0.5	0.5		
Bigeye poacher	6	0.5	0.2	0.1	0.1	0.70
Whitebarred prickleback	15	0.5	0.1	0.1	0.4	0.47
Brown box crab	1	0.4	0.4	0.4		
Blacktail snailfish	1	0.4	0.4	0.4	0.1	0.98
Cushion star	3	0.4	0.3	0.2		
Brown irish lord	2	0.4	0.3	0.2	0.5	0.84
Cookie star	6	0.4	0.2	0.1		
Mud star	7	0.4	0.2	0.1		
Salps	5	0.4	0.2	0.1		
Blackfin sculpin	3	0.3	0.3	0.3	0.1	0.98
Box crabs	2	0.3	0.3	0.2		
Black hagfish	2	0.3	0.1	0.1	0.1	0.71
Glass shrimp	4	0.3	0.3	0.3		
Northern ronquil	11	0.3	0.1	0.0	0.2	0.49
Pacific sand lance	2	0.3	0.2	0.1	0.4	0.73
Lewismoon snail	2	0.3	0.1	0.1		
Smootheye poacher	14	0.3	0.1	0.0	0.1	0.61
Long-armed sea star	2	0.2	0.1	0.1		
Rose starfish	6	0.2	0.1	0.1		
Shiner perch	2	0.2	0.2	0.1	0.0	0.98
Sea pen	3	0.2	0.2	0.1		
Ribbed sculpin	2	0.2	0.2	0.2	0.3	1.03
Pallid urchin	4	0.2	0.1	0.1		
Pink scallop, (aka reddish scallc	2	0.2	0.2	0.1		
Shrimp	6	0.2	0.1	0.1		
Blacktip poacher	1	0.2	0.2	0.2	0.1	1.00
Solaster paxillatus	1	0.2	0.2	0.2		
Ophiura sarsi	8	0.2	0.1	0.1		
Pacific viperfish	7	0.1	0.0	0.0	0.0	0.44

Table 7. Continued

Species	Number of Tows	Catch Weight (kg) Total	Maximum	Mean	Biomass (tonnes)	Relative Error
Benthoctopus	1	0.1	0.1	0.1		
Octopus	1	0.1	0.1	0.1		
Pacific red octopus	2	0.1	0.1	0.1		
Euphausiids	1	0.1	0.1	0.1		
Heterozonias alternatus	1	0.1	0.1	0.1		
Salp	1	0.1	0.1	0.1		
Shortfin eelpout	1	0.1	0.1	0.1	0.1	0.96
Pacific bobtail squid	7	0.1	0.1	0.0		
Polychaete worms	2	0.1	0.1	0.1		
Neptunea amianta	1	0.1	0.1	0.1		
Pacific lamprey	8	0.1	0.1	0.0	0.0	0.82
Pallid eelpout	2	0.1	0.1	0.0	0.0	0.88
Plainfin midshipman	1	0.1	0.1	0.1	0.1	1.00
Poachers	2	0.1	0.0	0.0		
Peanutworms	4	0.0	0.0	0.0		
Vermillion starfish	3	0.0	0.0	0.0		
Opalescent inshore squid	2	0.0	0.0	0.0		
Snailfishes	4	0.0	0.0	0.0		
Blackfin poacher	3	0.0	0.0	0.0	0.0	1.00
Harlequin rockfish	1	0.0	0.0	0.0	0.0	1.01
Lampshells	5	0.0	0.0	0.0		
Cheiraster dawsoni	3	0.0	0.0	0.0		
Gray starsnout	1	0.0	0.0	0.0	0.0	0.99
Northern lampfish	3	0.0	0.0	0.0	0.0	0.98
Aphroditidae	1					
Bivalve molluscs	1					
Blood star	1					
Blue lanternfish	1					
California armina	1					
Crangons	4					
Crested bigscale	1					
Ctenophora	2					
Cucumariidae	1					
Gastropods	1					
Graceful kelp crab	1					
Isopods	14					
Lanternfishes	1					
Large eyed eualid	1					
Longfin dragonfish	1					
Northern sculpin	1					
Ophiura	1					
Pinpoint lampfish	1					
Pseudarchaster alascensis	1					
Puget sound rockfish	1					
Sculpins	1					
Sea lilies and feather stars	2					

Table 7. Continued.

Species	Number of Tows	Catch Weight (kg) Total	Maximum	Mean	Biomass (tonnes)	Relative Error
Seaslugs	2					
Shining tubeshoulder	1					
Slender snipe eel	1					
Slim sculpin	5					
Spike shrimp (horned shrimp)	1					
Squat lobster	1					
Sturgeon poacher	2					
Turban snails	1					
Viperfishes	1					
Whitetail sculpin	2					
Bryozoa	8	0.0	0.0	0.0		
Bivalve molluscs	5	0.0	0.0	0.0		
Crangons	35	0.0	0.0	0.0		
Dipsacaster anoplus	1	0.0	0.0	0.0		
Doridídae	7	0.0	0.0	0.0		
Pacific spiny lumpsucker	4	0.0	0.0	0.0	0.0	0.92
Sand lances	1	0.0	0.0	0.0		
Sculpins	2	0.0	0.0	0.0		
Sea mouse	3	0.0	0.0	0.0		
Six-rayed starfish	1	0.0	0.0	0.0		
Spotfin sculpin	1	0.0	0.0	0.0	0.0	0.99
Bigeye poacher	6	0.0	0.0	0.0	0.0	0.97
California headlightfish	1	0.0	0.0	0.0	0.0	1.01
Northern ronquil	3	0.0	0.0	0.0	0.0	0.97
Spider crabs	3	0.0	0.0	0.0		
Amphiophiura ponderosa	1					
Aphroditidae	1					
Blackfin poacher	1					
Blood star	1					
Cancer crabs	2					
Common argid	3					
Crangonidae	1					
Henricia sanguinolenta	5					
Heptacarpus flexus	3					
Isopods	20					
Lampshells	3					
Left-handed hermits	2					
Lophaster furcilliger vexator	1					
Morning sun starfish	1					
Nelson's argid	7					
Northern argid	1					
Northern lampfish	4					
Northern sculpin	1					
Ophiopholis	2					
Ophiura	7					
Pacific krill	1					

Table 7. Continued.

Species	Number of Tows	Catch Weight (kg) Total	Maximum	Mean	Biomass (tonnes)	Relative Error
Pacific lyre crab	1					
Pacific rock crab	2					
Pacific viperfish	4					
Paguroidea	1					
Pagurus	2					
Peanutworms	1					
Prickly snailfish	2					
Pubescent porcelain crab	1					

Table 8. Number of samples and number of recorded biological attributes per species sampled.

Species	Number of Samples	Number of Recorded Biological Attributes				
		Length	Weight	Sex	Maturity	Age
Aleutian skate	1	1	0	1	0	0
American shad	1	133	0	0	0	0
Arrowtooth flounder	65	2,788	1,328	2,788	901	495
Aurora rockfish	1	4	0	4	0	0
Big skate	6	9	1	9	0	0
Bigfin eelpout	2	35	0	0	0	0
Bocaccio	49	112	112	111	111	112
Brown cat shark	8	21	0	21	0	0
Canary rockfish	50	541	347	540	347	332
Chinook salmon	1	1	0	1	0	0
Curlfin sole	6	63	18	63	18	0
Darkblotched rockfish	41	467	450	467	450	450
Dover sole	65	2,870	1,698	2,871	996	478
English sole	33	1,420	936	1,421	669	451
Eulachon	17	1,004	0	0	0	0
Flathead sole	15	808	357	808	215	140
Greenstriped rockfish	36	1,563	467	1,564	269	103
Kelp greenling	4	14	0	14	0	0
Lingcod	86	306	41	306	41	41
Longnose skate	100	323	0	322	0	0
Pacific cod	68	726	607	726	600	314
Pacific hake	7	339	100	339	100	0
Pacific halibut	85	145	132	145	7	0
Pacific herring	7	425	0	0	0	0
Pacific ocean perch	35	1,887	1,058	1,887	619	455
Pacific sanddab	18	1,078	600	1,078	397	242
Pacific tomcod	5	379	0	379	0	0
Petrale sole	93	1,176	809	1,176	797	793
Pygmy rockfish	8	207	0	207	0	0
Quillback rockfish	8	49	49	49	49	49
Redbanded rockfish	64	449	422	449	422	422
Redstripe rockfish	19	949	332	949	288	208
Rex sole	73	3,663	1,686	3,663	1,127	465
Rosethorn rockfish	13	477	0	477	0	0
Rougheye rockfish	25	373	291	373	291	241
Sablefish	80	659	150	659	142	142
Sandpaper skate	29	50	0	50	0	0
Sharpchin rockfish	26	1,339	746	1,341	511	300
Shortbelly rockfish	1	14	0	14	0	0
Shortraker rockfish	9	51	51	51	51	51
Shortspine thornyhead	35	2,071	357	2,067	59	125
Silvergray rockfish	12	358	95	358	95	95
Slender sole	26	1,364	151	1,364	28	0
Southern rock sole	20	412	390	412	389	342
Spiny dogfish	38	2,067	535	2,067	0	47
Splitnose rockfish	37	2,060	793	2,060	444	223
Spotted ratfish	24	1,245	0	1,244	0	0
Starry flounder	1	1	0	1	0	0
Stripetail rockfish	3	51	37	51	37	37
Walleye pollock	1	31	0	31	0	0
Widow rockfish	3	17	0	17	0	0
Wolf eel	2	2	2	0	0	0
Yelloweye rockfish	22	75	75	75	74	75
Yellowmouth rockfish	2	77	56	77	56	56
Yellowtail rockfish	17	620	425	620	326	235
Total	**1,503**	**37,369**	**15,704**	**35,767**	**10,926**	**7,519**

Table 9. Numbers of samples and specimens by sample type and species.

Species	Total		Len./Sex		Len./Sex/Wt.		Len./Sex/Wt./Age	
	N	n	N	n	N	n	N	n
Aleutian skate	1	1	1	1	0	0	0	0
American shad	1	133	1	133	0	0	0	0
Arrowtooth flounder	65	2,788	38	1,460	17	831	10	495
Aurora rockfish	1	4	1	4	0	0	0	0
Big skate	6	9	5	8	1	1	0	0
Bigfin eelpout	2	35	2	35	0	0	0	0
Bocaccio	49	112	0	0	0	0	48	111
Brown cat shark	8	21	8	21	0	0	0	0
Canary rockfish	50	541	38	194	1	15	11	332
Chinook salmon	1	1	1	1	0	0	0	0
Curlfin sole	6	63	5	45	1	18	0	0
Darkblotched rockfish	41	467	1	17	0	0	40	450
Dover sole	65	2,870	29	1,170	25	1,222	11	478
English sole	33	1,420	14	485	10	484	9	451
Eulachon	17	1,004	17	1,004	0	0	0	0
Flathead sole	15	808	8	451	4	217	3	140
Greenstriped rockfish	36	1,563	27	1,097	7	363	2	103
Kelp greenling	4	14	4	14	0	0	0	0
Lingcod	86	306	83	265	0	0	3	41
Longnose skate	100	323	100	323	0	0	0	0
Pacific cod	68	726	41	119	1	7	26	314
Pacific hake	7	339	5	239	2	100	0	0
Pacific halibut	85	145	12	13	73	132	0	0
Pacific herring	7	425	7	425	0	0	0	0
Pacific ocean perch	35	1,887	17	829	10	603	8	455
Pacific sanddab	18	1,078	8	478	6	358	4	242
Pacific tomcod	5	379	5	379	0	0	0	0
Petrale sole	93	1,176	61	365	1	14	31	793
Pygmy rockfish	8	207	8	207	0	0	0	0
Quillback rockfish	8	49	0	0	0	0	8	49
Redbanded rockfish	64	449	11	27	0	0	53	422
Redstripe rockfish	19	949	12	617	3	124	4	208
Rex sole	73	3,663	39	1,976	24	1,222	9	465
Rosethorn rockfish	13	477	13	477	0	0	0	0
Rougheye rockfish	25	373	4	82	1	50	19	241
Sablefish	80	659	74	502	1	8	5	142
Sandpaper skate	29	50	29	50	0	0	0	0
Sharpchin rockfish	26	1,339	12	595	8	438	6	300
Shortbelly rockfish	1	14	1	14	0	0	0	0
Shortraker rockfish	9	51	0	0	0	0	9	51
Shortspine thornyhead	35	2,071	28	1,714	5	231	2	125
Silvergray rockfish	12	358	10	263	0	0	2	95
Slender sole	26	1,364	23	1,213	3	151	0	0
Southern rock sole	20	412	6	22	2	47	12	342
Spiny dogfish	38	2,067	24	929	7	410	2	6
Splitnose rockfish	37	2,060	22	1,267	9	570	5	223
Spotted ratfish	24	1,245	24	1,245	0	0	0	0
Starry flounder	1	1	1	1	0	0	0	0
Stripetail rockfish	3	51	2	14	0	0	1	37
Walleye pollock	1	31	1	31	0	0	0	0
Widow rockfish	3	17	3	17	0	0	0	0
Wolf eel	2	2	0	0	0	0	0	0
Yelloweye rockfish	22	75	0	0	0	0	22	75
Yellowmouth rockfish	2	77	1	21	0	0	1	56
Yellowtail rockfish	17	620	8	195	4	190	5	235
Total	**1,503**	**37,369**	**895**	**21,054**	**226**	**7,806**	**371**	**7,477**

Table 10. Statistics of individual length and weight, and sex proportion by species.

	Length (cm)			Weight (kg)			Sex Proportion	
Species	Min.	Max.	Mean	Min.	Max.	Mean	Male	Female
Aleutian skate	111	111	111				1.00	0.00
American shad	19	41	29				0.00	0.00
Arrowtooth flounder	14	78	45	0.0	4.0	1.0	0.34	0.66
Aurora rockfish	26	33	29				0.00	1.00
Big skate	52	183	98	38.8	38.8	38.8	0.33	0.67
Bigfin eelpout	21	58	33				0.00	0.00
Bocaccio	43	88	60	0.8	8.9	2.7	0.71	0.28
Brown cat shark	13	71	45				0.74	0.26
Canary rockfish	24	62	47	0.3	3.3	1.6	0.53	0.47
Chinook salmon	67	67	67				0.00	1.00
Curlfin sole	20	35	28	0.2	0.4	0.3	0.65	0.35
Darkblotched rockfish	14	50	32	0.0	2.0	0.6	0.49	0.51
Dover sole	20	68	35	0.1	2.7	0.5	0.57	0.43
English sole	13	43	30	0.0	0.8	0.3	0.24	0.76
Eulachon	9	23	16				0.00	0.00
Flathead sole	12	38	30	0.0	0.5	0.2	0.41	0.59
Greenstriped rockfish	9	39	26	0.0	0.8	0.3	0.52	0.48
Kelp greenling	23	35	30				0.43	0.57
Lingcod	30	103	67	0.2	5.8	1.7	0.22	0.78
Longnose skate	30	142	82				0.44	0.55
Pacific cod	21	75	41	0.1	4.8	0.8	0.48	0.52
Pacific hake	24	71	53	0.3	1.6	0.9	0.38	0.62
Pacific halibut	9	119	75	2.3	19.1	5.2	0.68	0.32
Pacific herring	14	25	19				0.00	0.00
Pacific ocean perch	14	50	37	0.2	1.7	0.8	0.51	0.49
Pacific sanddab	12	36	23	0.0	0.4	0.1	0.42	0.58
Pacific tomcod	15	27	19				0.36	0.64
Petrale sole	15	57	35	0.0	2.1	0.6	0.46	0.54
Pygmy rockfish	11	24	18				0.39	0.61
Quillback rockfish	28	45	39	0.4	1.8	1.2	0.43	0.57
Redbanded rockfish	11	59	34	0.0	3.7	0.8	0.49	0.51
Redstripe rockfish	14	42	29	0.1	1.0	0.3	0.47	0.53
Rex sole	14	48	30	0.0	0.5	0.2	0.59	0.41
Rosethorn rockfish	13	34	24				0.58	0.42
Rougheye rockfish	21	61	45	0.2	3.3	1.4	0.55	0.45
Sablefish	33	94	60	0.3	6.1	2.5	0.67	0.33
Sandpaper skate	29	64	54				0.56	0.44
Sharpchin rockfish	14	39	26	0.1	1.0	0.3	0.47	0.53
Shortbelly rockfish	19	26	24				0.43	0.57
Shortraker rockfish	52	94	66	1.9	14.3	5.1	0.45	0.55
Shortspine thornyhead	1	58	22	0.0	2.7	0.3	0.52	0.48
Silvergray rockfish	32	65	51	1.2	4.1	2.0	0.74	0.26
Slender sole	8	32	20	0.0	0.2	0.1	0.39	0.61
Southern rock sole	9	44	27	0.0	1.2	0.3	0.28	0.72
Spiny dogfish	30	118	68	0.4	5.7	1.1	0.58	0.42
Splitnose rockfish	7	39	23	0.0	1.0	0.2	0.53	0.47
Spotted ratfish	13	49	33				0.52	0.48
Starry flounder	63	63	63				0.00	1.00
Stripetail rockfish	12	30	20	0.07	0.37	0.14	0.71	0.29
Walleye pollock	19	25	22				0.61	0.39
Widow rockfish	28	44	34				0.53	0.47
Wolf eel	127	149	138	1.8	4.4	3.1	0.00	0.00
Yelloweye rockfish	33	70	54	0.6	7.0	3.3	0.37	0.63
Yellowmouth rockfish	35	53	45	1.3	2.2	1.7	0.52	0.48
Yellowtail rockfish	25	57	44	0.5	2.5	1.3	0.63	0.37

Table 11. Data collected from net sensors, showing the number of tows from which each data type was collected.

Sensor	Attribute	Number of Tows	Number of Records
Global Positioning System (GPS)	Vessel Direction - Compass Bearing True North	138	243,347
	Vessel Position - Latitude	138	243,347
	Vessel Position - Longitude	138	243,347
	Vessel Speed Over Ground	138	243,347
NMFS Bottom Contact Sensor	Bottom Contact Sensor Tilt Angle	151	128,316
Seabird SBE 19plus Seacat Profiler	Dissolved Oxygen	150	175,292
	Net Depth	150	87,646
	Salinity At Net Depth	150	87,646
	Water Temperature At Net Depth	150	87,646
Seabird SBE 39 Temperatue and Depth Sensor	Net Depth	158	51,538
	Water Temperature At Net Depth	158	51,538

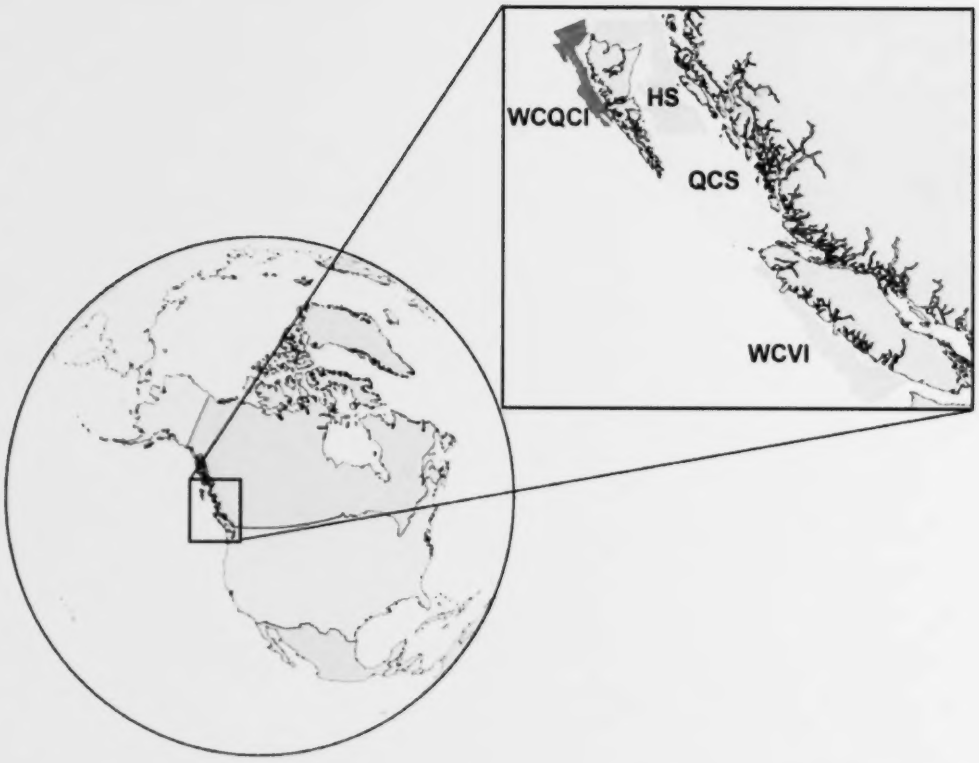

Figure 1. Locations of the modern groundfish trawl surveys on the coast of British Columbia, Canada. HS = Hecate Strait; WCQCI = west coast of Queen Charlotte Islands; QCS = Queen Charlotte Sound; WCVI = west coast of Vancouver Island.

Figure 2. The Canadian Coast Guard Ship W.E. Ricker.

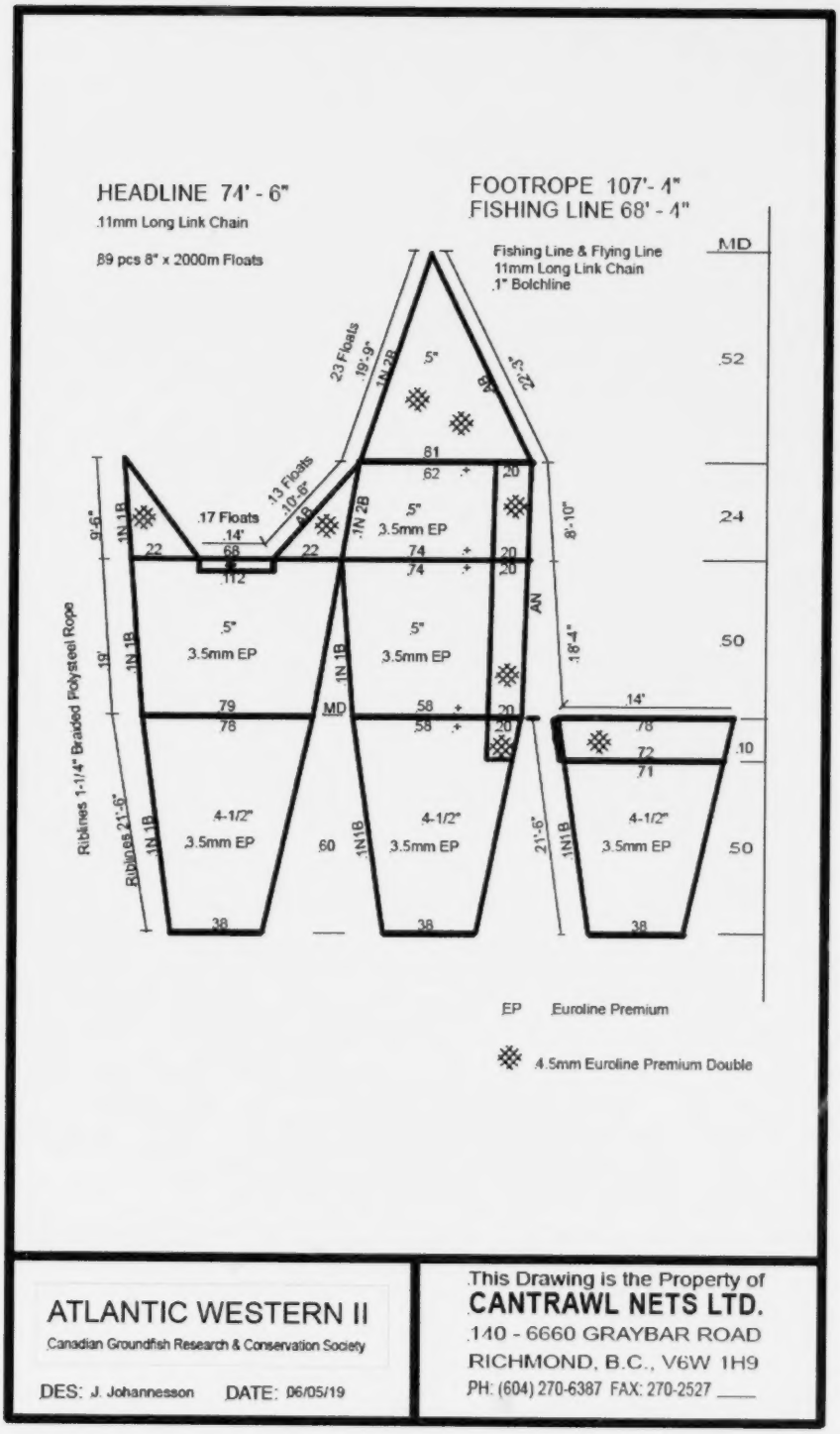

Figure 3. Design specifications for the Atlantic Western IIa box trawl used on the survey.

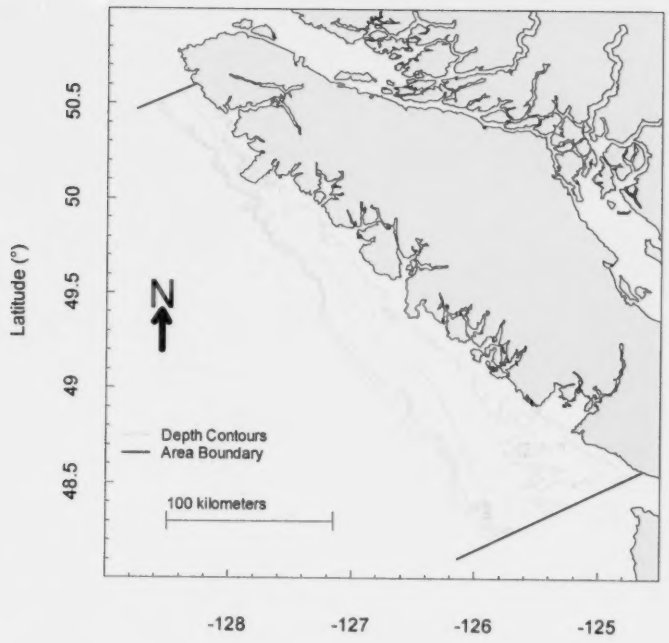

Figure 4. The Queen Charlotte Sound study area showing area boundary and stratum depth contours.

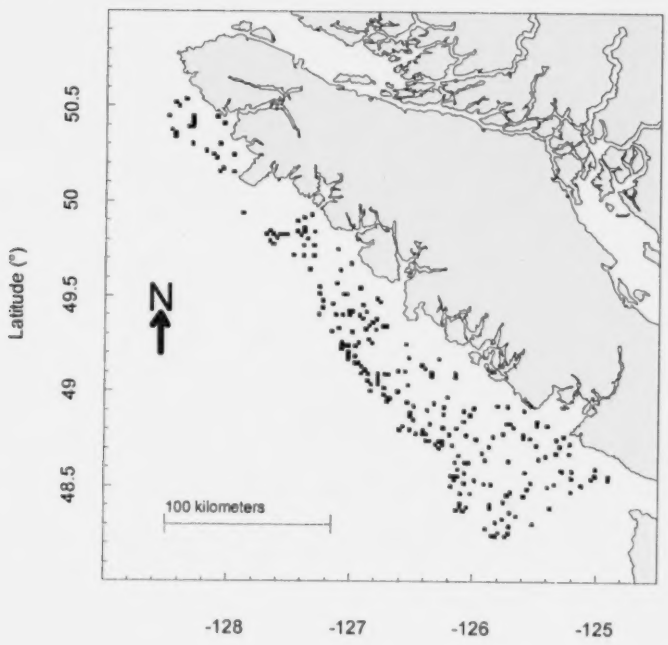

Figure 5. Initial status of the sampling frame showing the 246 selected fishing locations.

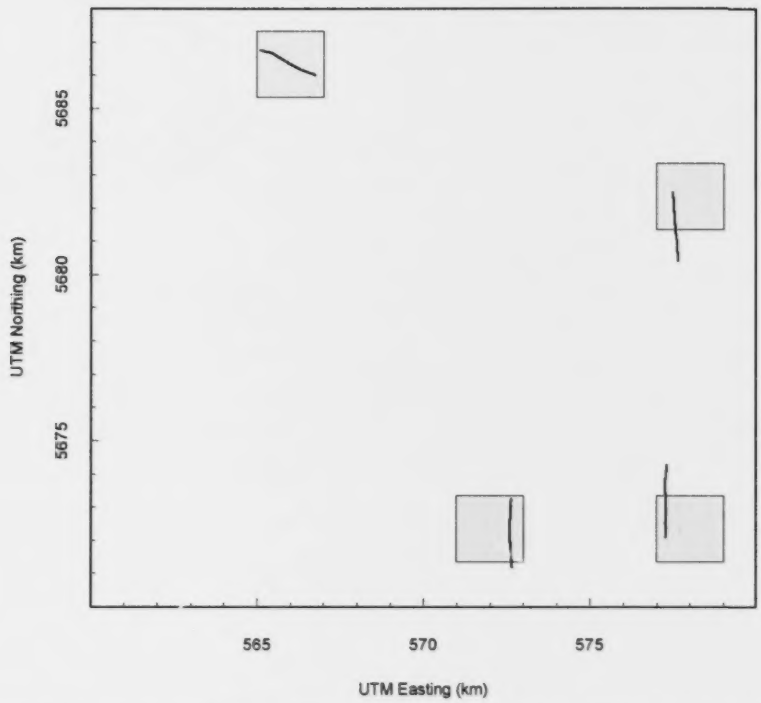

Figure 6. Example tow tracks demonstrating variations in track location within blocks.

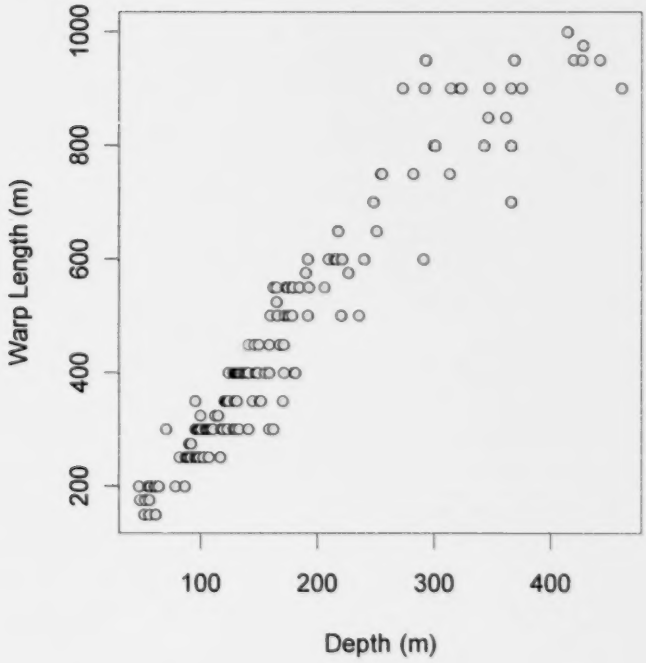

Figure 7. Warp length vs. starting depth.

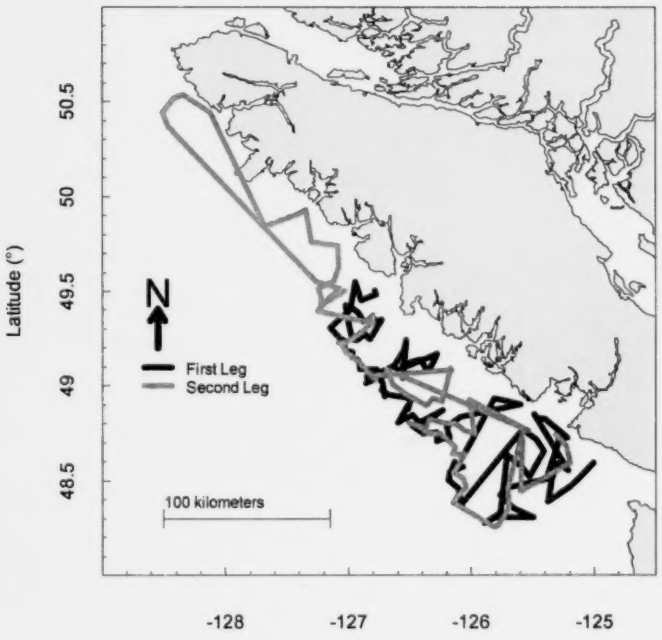

Figure 8. The paths followed on each leg of the survey.

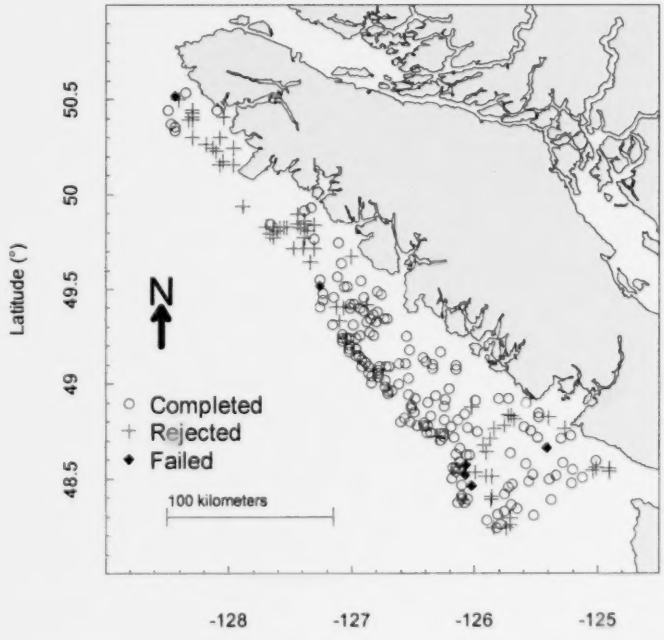

Figure 9. Final status of the sampling frame showing locations that were fished successfully (completed), rejected prior to fishing (rejected), or abandoned after one or more unsuccessful fishing attempts (failed).

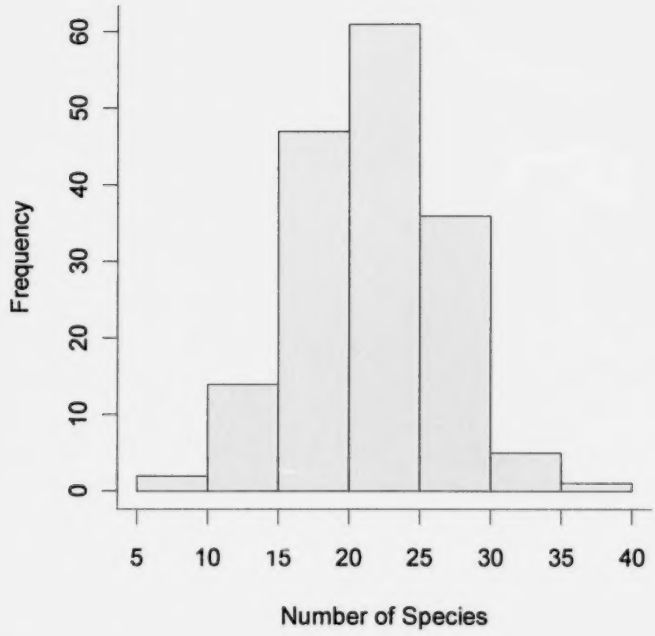

Figure 10. Histogram of number of species caught per tow.

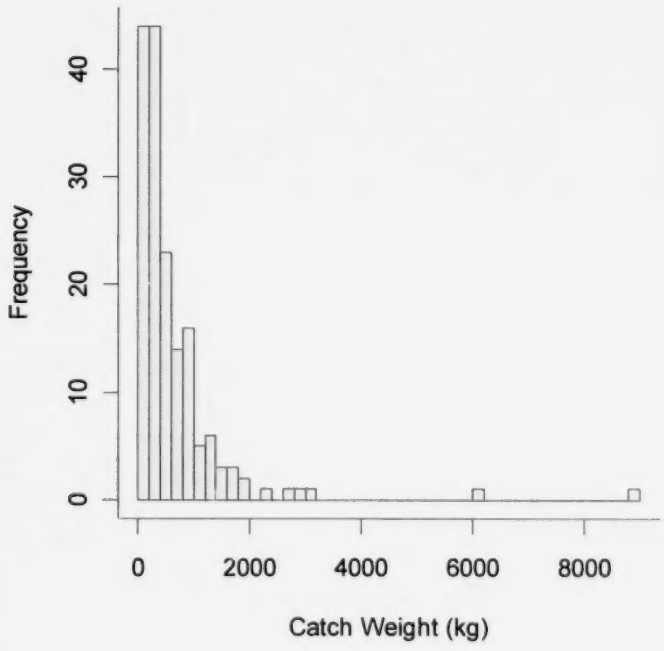

Figure 11. Histogram of catch weight per tow.

Species	2004	2006	2008
Arrowtooth flounder	9,917.3	9,155.5	8,318.1
Bigfin eelpout	8.4	8.2	17.6
Blackbelly eelpout	9.2	4.7	41.7
Curlfin sole	67.4	12.8	38.3
Dover sole	3,280.1	2,046.8	2,651.5
English sole	1,871.5	1,358.1	1,289.6
Flathead sole	473.5	223.3	704.5
Greenstriped rockfish	239.4	623.7	1,107.9
Longnose skate	845.7	580.1	737.4
Pacific cod	1,329.8	1,289.5	605.1
Pacific hake	3,269.3	76.1	276.5
Pacific halibut	1,042.6	1,617.0	611.5
Pacific herring	8.4	26.5	39.7
Pacific ocean perch	5,437.1	3,086.2	1,762.4
Pacific sanddab	1,222.8	1,138.4	1,334.2
Petrale sole	437.7	320.3	646.7
Redbanded rockfish	282.9	142.9	101.2
Rex sole	2,349.6	2,115.0	3,543.1
Rougheye rockfish	345.5	446.5	163.8
Sablefish	4,589.9	1,939.8	543.1
Sandpaper skate	10.3	13.5	16.3
Sharpchin rockfish	466.1	1,257.7	1,019.0
Shortspine thornyhead	376.6	319.8	264.8
Silvergray rockfish	648.4	776.9	374.8
Slender sole	250.4	107.3	299.2
Southern rock sole	393.6	88.3	237.5
Spiny dogfish	19,680.2	26,501.8	15,020.8
Spotted ratfish	1,430.4	1,556.2	3,460.6
Threadfin sculpin	23.0	4.6	27.5
Yelloweye rockfish	204.0	89.3	161.4

Figure 12. Biomass indices (tonnes) of selected species from all years of the west coast Vancouver Island survey.

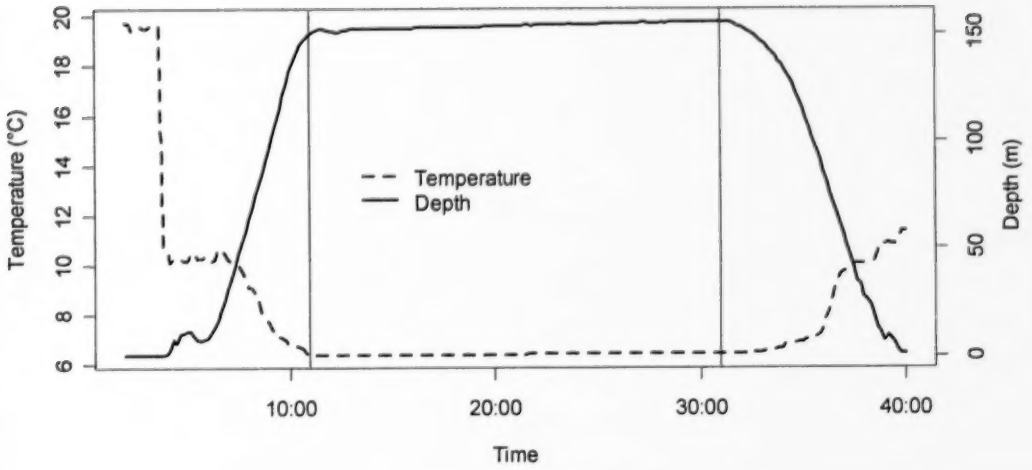

Figure 13. Example of a Seabird 39 temperature and depth profile. The vertical lines indicate the start and end of net contact with the sea floor.

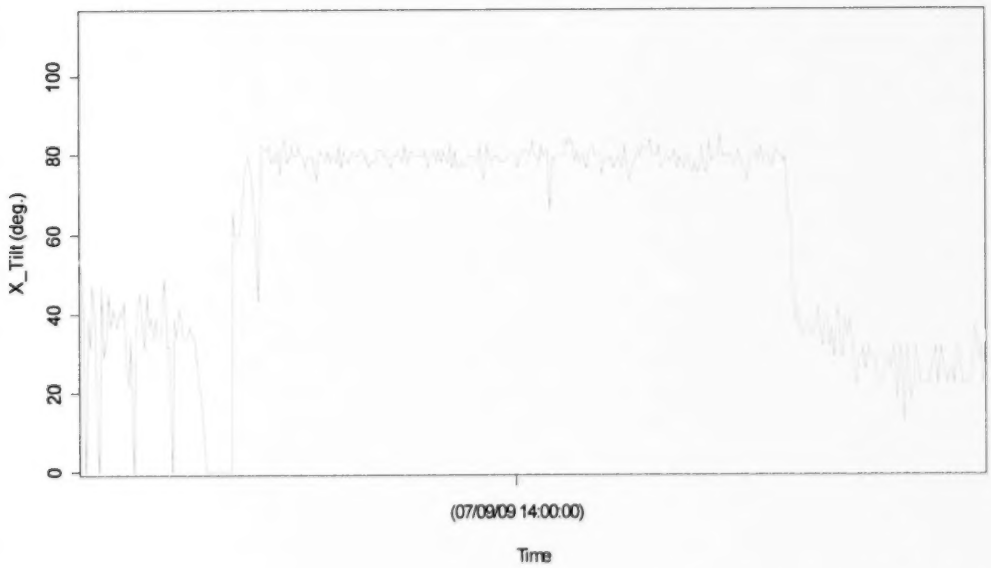

Figure 14. An example of an NMFS bottom contact sensor profile. The raised segment in the middle of the profile at approximately 80° indicates where the net made contact with the sea floor.

APPENDIX A: BRIDGE LOG

Tow	Date	Time	Latitude	Longitude	Depth (m)	Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable?
1	May 27	08:19	48.5965	125.0056	70	21	2.7	300	154.9	Yes
2	May 27	09:57	48.5057	125.1430	124	21	2.7	400	299.0	Yes
3	May 27	11:25	48.4671	125.2063	149	21	3.5	400	265.0	Yes
4	May 27	13:38	48.3920	125.3790	155	20	2.8	400	352.0	Yes
5	May 27	15:20	48.5171	125.3478	119	22	5.5	300	324.9	Yes
6	May 27	16:32	48.5910	125.2966	118	21	4.4	300	179.9	Yes
7	May 27	18:01	48.5535	125.2126	102	21	5.5	250	719.9	Yes
8	May 28	13:44	48.8514	125.4916	99	22	5.3	250	160.4	Yes
9	May 28	14:39	48.8340	125.4749	95	21	4.6	250	106.6	Yes
10	May 28	15:57	48.8292	125.4066	83	5			4.0	No
11	May 28	17:03	48.7293	125.2229	56	20	2.9	150	127.1	Yes
12	May 28	18:13	48.7206	125.2956	110	9			0.0	No
13	May 28	19:16	48.7069	125.2938	51	21	4.8	150	385.8	Yes
14	May 29	07:13	48.5073	125.3967	129	19	5	350	425.6	Yes
15	May 29	08:22	48.4874	125.5553	95	22	4.8	350	142.2	Yes
16	May 29	09:30	48.4641	125.7171	107	23	4.4	300	236.0	Yes
17	May 29	10:42	48.4254	125.7668	131	22	5.2	350	253.2	Yes
18	May 29	12:03	48.3554	125.6560	141	24	5.3	400	1,552.2	Yes
19	May 29	13:30	48.3120	125.4999	122	21	5.3	350	539.5	Yes
20	May 29	15:56	48.3119	125.8095	172	22	5.7	500	639.1	Yes
21	May 29	17:02	48.2770	125.8931	461	26	4.8	900	608.5	Yes
22	May 29	18:51	48.3300	125.7661	150	21	5.1	450	2,765.0	Yes
23	May 30	07:14	48.6396	125.7134	55	22	5.1	200	82.2	Yes
24	May 30	08:33	48.5756	125.5942	101	20	5.1	300	454.5	Yes
25	May 30	09:37	48.5262	125.5315	122	21	5.7	350	504.9	Yes
26	May 30	11:23	48.6584	125.4111	63	6			0.0	No
27	May 30	13:58	48.7188	125.4772	120	22	5.3	350	459.5	Yes
28	May 30	15:13	48.7729	125.5837	164	21	5.9	450	717.8	Yes
29	May 31	09:50	48.3994	126.0556	215	22	5.1	600	1,145.1	Yes
30	May 31	11:00	48.3940	126.1181	313	25	5.3	750	1,282.9	Yes
31	May 31	12:39	48.3746	126.0730	366	23	5	800	1,333.5	Yes
32	May 31	14:08	48.4647	126.1027	187	22	6	550	639.9	Yes
33	May 31	15:25	48.5024	126.1871	399	19	5.5		563.4	Yes
34	May 31	16:43	48.5480	126.1797	362	26	5	850	1,874.9	Yes
35	May 31	18:37	48.5779	126.0683	140	3			0.0	No
36	Jun 1	08:20	48.5588	126.1589	193	20	5.2	550	1,652.4	Yes
37	Jun 1	09:28	48.6007	126.1372	159	21	5	400	585.3	Yes
38	Jun 1	10:35	48.5545	126.1279	171	22	5.9	450	1,474.1	Yes
39	Jun 1	13:48	48.9366	125.8173	47	8	5.9	200	174.8	No
40	Jun 1	14:41	48.9270	125.7372	97	20	5.3	250	1,024.6	Yes
41	Jun 1	15:37	48.9037	125.5978	90	22	5	250	840.0	Yes
42	Jun 2	07:31	48.8358	126.0931	87	21	5.3	250	181.0	Yes
43	Jun 2	08:50	48.7887	126.2035	137	17	5	400	239.5	Yes

Appendix A continued.

Tow	Date	Time	Latitude	Longitude	Depth (m)	Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable?
44	Jun 2	15:26	53.5138	131.2897	28	19	5.9	100	125.3	Yes
45	Jun 2	18:17	53.5872	131.0818	40	19	5.5	100	127.3	Yes
46	Jun 3	07:04	53.7390	131.2553	38	19	5.8	100	496.0	Yes
47	Jun 3	08:20	53.6618	131.0602	51	19	5.8	150	272.3	Yes
48	Jun 3	09:25	53.6713	130.9065	44	19	5.5	150	141.7	Yes
49	Jun 3	10:18	53.6840	130.7967	53	19	5.5	150	332.2	Yes
50	Jun 3	10:01	53.6545	130.8102	53	18	5.6	150	232.1	Yes
51	Jun 3	12:14	53.5558	130.9027	65	19	5.6	150	142.8	Yes
52	Jun 3	13:31	53.5493	130.7240	144	19	5.5	400	703.6	Yes
53	Jun 3	14:39	53.5793	130.7560	154	19	5.5	350	1,439.5	Yes
54	Jun 3	15:59	53.6855	130.7222	130	19	5.5	300	488.2	Yes
55	Jun 3	17:31	53.6867	130.5412	46	20	5.4	150	517.4	Yes
56	Jun 3	18:34	53.7202	130.5930	64	20	5.3	150	284.8	Yes
57	Jun 4	07:17	53.7557	130.6328	98	19	5.4	250	139.9	Yes
58	Jun 4	08:27	53.7895	130.6785	100	19	5.5	250	278.7	Yes
59	Jun 4	09:45	53.8432	130.7623	61	11	5	150	125.4	No
60	Jun 4	11:50	53.9565	130.9063	61	17	5.7	150	1,517.0	Yes
61	Jun 4	14:52	53.9313	131.2260	32	15	5.6	100	301.1	Yes
62	Jun 4	17:44	54.0065	131.0340	78	19	5.7	200	497.4	Yes
63	Jun 5	07:37	54.0983	130.9752	72	19	5.5	200	234.5	Yes
64	Jun 5	09:59	54.1115	131.2597	30	19	5.7	100	74.6	Yes
65	Jun 5	11:51	54.1478	131.2088	30	20	5.8	100	152.1	Yes
66	Jun 5	13:06	54.1982	131.2998	28	19	5.6	100	539.2	Yes
67	Jun 5	14:55	54.2898	131.5157	128	19	5.5	350	969.1	Yes
68	Jun 5	15:55	54.3140	131.3662	119	19	5.5	300	616.2	Yes
69	Jun 5	16:50	54.3397	131.2437	84	17	6	200	2,995.4	Yes
70	Jun 6	07:06	54.2265	132.8883	160	19	5.6	350	1,330.0	Yes
71	Jun 6	08:32	54.2098	132.7107	157	20	5.6	350	509.8	Yes
72	Jun 6	09:41	54.2493	132.6562	169	20	5.5	350	10.5	Yes
73	Jun 6	10:35	54.2422	132.6168	140	19	5.2	350	564.4	Yes
74	Jun 6	12:06	54.2665	132.5260	154	3	5.9	350	0.0	No
75	Jun 6	16:20	54.1828	132.5893	94	19	5.5	250	132.6	Yes
76	Jun 6	17:39	54.1517	132.5565	72	19	5.8	200	1,207.1	Yes
77	Jun 7	07:18	54.1193	132.4958	41	20	5.9	100	132.2	Yes
78	Jun 7	08:22	54.1408	132.4013	77	19	5.6	200	423.1	Yes
79	Jun 7	09:37	54.2167	132.3122	126	19	5.7	300	382.2	Yes
80	Jun 9	07:29	54.2735	132.3845	188	19	5.6	400	102.8	Yes
81	Jun 9	08:21	54.2842	132.3473	195	19	5.7	450	142.7	Yes
82	Jun 9	09:31	54.3183	132.3833	207	22	5.8	450	120.3	Yes
83	Jun 9	10:59	54.2283	132.3747	133	19	5.5	300	318.2	Yes
84	Jun 9	13:09	54.2655	132.1367	164	19	5.5	350	118.0	Yes
85	Jun 9	14:03	54.2467	132.1902	146	19	5.6	350	399.0	Yes
86	Jun 9	14:56	54.2642	132.2047	173	21	5.8	350	186.9	Yes

Appendix A continued.

Tow	Date	Time	Latitude	Longitude	Depth (m)	Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable?
87	Jun 7	12:14	49.2392	127.0355	192	21	5.3	600	273.9	No
88	Jun 7	13:28	49.2376	127.0298	192	20	6.1	600	739.7	Yes
89	Jun 7	14:22	49.2544	127.0730	255	21	4.8	750	958.3	Yes
90	Jun 7	15:34	49.3086	127.1505	208	19			353.0	Yes
91	Jun 7	17:28	49.3976	127.0027	135	22	6.1	400	500.5	Yes
92	Jun 7	18:23	49.4287	127.0197	131	21	5.9	400	623.4	Yes
93	Jun 8	07:11	49.3114	126.9950	139	22			307.3	Yes
94	Jun 8	08:03	49.2469	126.9703	168	19	6.1	450	649.7	Yes
95	Jun 8	08:57	49.2413	126.9330	160	21	5.3	500	458.8	Yes
96	Jun 8	10:09	49.2748	126.8629	133	21		400	159.7	Yes
97	Jun 8	10:59	49.2496	126.8287	129	21	5.3	350	137.2	Yes
98	Jun 8	12:40	49.3536	126.7272	88	23	5.6	250	120.7	Yes
99	Jun 8	13:46	49.3437	126.7480	97	19	5.9	300	76.5	Yes
100	Jun 8	14:48	49.3582	126.8199	109	20	6.4	300	308.2	Yes
101	Jun 8	15:41	49.3387	126.8832	132	21	5.3	400	239.9	Yes
102	Jun 8	16:34	49.3805	126.9113	129	19	5.8	400	346.6	Yes
103	Jun 8	17:50	49.3981	126.9377	129	20			328.5	Yes
104	Jun 8	18:51	49.4181	126.9797	128	21	6.4	400	395.1	Yes
105	Jun 9	07:10	49.5508	126.9447	90	19	6.2	275	193.6	Yes
106	Jun 9	08:50	49.4537	126.8984	100	20			130.2	Yes
107	Jun 9	10:47	49.4856	126.7744	48	20	5.2	175	169.1	Yes
108	Jun 9	11:58	49.5026	126.7865	52	20	5.3	175	124.9	Yes
109	Jun 11	10:34	49.5027	127.0298	117	20	5.6	325	286.7	Yes
110	Jun 11	11:59	49.4303	127.2210	173	21	5.1	550	1,274.1	Yes
111	Jun 11	13:30	49.4702	127.2197	165	27		525	1,853.0	Yes
112	Jun 11	14:41	49.5157	127.2446		6		550	315.6	No
113	Jun 11	15:42	49.5542	127.1156		20		375	165.3	Yes
114	Jun 11	16:41	49.6321	127.0768	104	19		300	233.4	Yes
115	Jun 11	18:55	49.7410	127.0835	64	19	5.1	200	152.6	Yes
116	Jun 12	07:23	49.7602	127.3008	82	20	5.7	250	78.6	Yes
117	Jun 12	09:08	49.9304	127.3450	60	21	5.9	200	69.4	Yes
118	Jun 12	10:02	49.9179	127.3870	57	16	3.7	200	34.6	Yes
119	Jun 12	13:54	49.8463	127.6784	166	19		500	265.4	Yes
120	Jun 13	07:14	50.4463	128.1195	56	20		175	73.8	Yes
121	Jun 13	09:21	50.5389	128.3442	105	19	5.7	300	155.4	Yes
122	Jun 13	10:56	50.5184	128.4220	175	19		550	273.3	No
123	Jun 13	13:00	50.4448	128.5115	217	19		600	615.4	Yes
124	Jun 13	14:06	50.3693	128.4627	343	16		800	569.1	Yes
125	Jun 13	15:21	50.3524	128.4279	300	19		800	1,190.9	Yes
126	Jun 13	16:35	50.3439	128.4247	346	20		850	891.2	Yes
127	Jun 14	12:16	49.5502	127.2609	165	17		550	412.2	Yes
128	Jun 14	13:33	49.5168	127.0727	123	19	6.6	350	149.6	Yes
129	Jun 14	14:42	49.4744	127.1484	147	23	6.6	400	251.6	Yes
130	Jun 14	16:03	49.3983	127.2556	282	19		750	808.1	Yes

Appendix A continued.

Tow	Date	Time	Latitude	Longitude	Depth (m)	Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable?
131	Jun 14	18:52	49.3406	126.8559	124	24		350	917.6	Yes
132	Jun 15	07:27	49.3763	126.8037	99	19	5.7	300	114.9	Yes
133	Jun 15	08:22	49.3306	126.8023	112	19		325	120.1	Yes
134	Jun 15	10:08	49.2342	127.0152	190	19		575	472.5	Yes
135	Jun 15	11:18	49.2270	127.0809	366	19		900	318.5	Yes
136	Jun 15	12:43	49.2307	127.0649	273	20		900	554.6	Yes
137	Jun 15	14:13	49.1769	127.0182	347	20		900	539.7	Yes
138	Jun 15	15:35	49.1233	126.9136	248	20		700	1,652.6	Yes
139	Jun 15	17:33	49.0350	126.7779	210	18		600	904.9	Yes
140	Jun 15	18:29	49.0582	126.7767	185	20	4.4	550	808.2	Yes
141	Jun 16	07:17	49.0863	126.1615	57	19		200	198.3	Yes
142	Jun 16	08:11	49.0948	126.1676	60	20		200	223.8	Yes
143	Jun 16	09:47	48.9690	126.2180	100	20		325	149.3	Yes
144	Jun 16	11:00	48.9199	126.2390	115	20		325	150.3	Yes
145	Jun 16	12:12	48.9369	126.3085	130	20		300	193.0	Yes
146	Jun 16	13:16	48.9009	126.3708	150	19		450	265.8	Yes
147	Jun 16	14:47	48.9575	126.5253	165	17		550	9,000.0	Yes
148	Jun 16	16:29	49.0063	126.6360	179	20		550	1,110.8	Yes
149	Jun 16	17:52	49.0892	126.6936	141	19		450	346.1	Yes
150	Jun 18	07:15	48.7642	125.5338	123	20		300	379.0	Yes
151	Jun 18	09:58	48.9294	126.0173	61	19		150	192.5	Yes
152	Jun 18	11:55	48.7506	125.9719	78	19		200	164.2	Yes
153	Jun 18	12:57	48.7677	126.0515	92	19		250	151.4	Yes
154	Jun 18	13:46	48.8034	126.1312	109	20		300	480.4	Yes
155	Jun 18	14:43	48.8059	126.2358	144	20		350	263.6	Yes
156	Jun 18	15:40	48.8274	126.3447	171	19		400	292.4	Yes
157	Jun 18	16:43	48.7761	126.3749	291	19		600	255.7	Yes
158	Jun 18	18:01	48.8081	126.5119	237	19		500	512.5	Yes
159	Jun 19	07:00	48.7876	126.4155	240	19		600	387.5	Yes
160	Jun 19	08:07	48.7526	126.3610	394	20		800	165.9	Yes
161	Jun 19	09:56	48.7508	126.2447	162	20		300	347.0	Yes
162	Jun 19	11:16	48.6768	126.1276	133	19		300	313.3	Yes
163	Jun 19	13:06	48.6432	126.1504	151	20		350	288.2	Yes
164	Jun 19	14:07	48.6361	126.0781	128	20		300	139.3	Yes
165	Jun 19	15:00	48.6426	126.0473	117	20	4.4	250	362.0	Yes
166	Jun 19	16:16	48.5433	126.1442	181	20	5	400	733.3	Yes
167	Jun 19	17:41	48.5142	126.0648	159	5		300	0.0	No
168	Jun 20	07:03	48.4696	126.0437	170	20	4	350	0.0	No
169	Jun 20	09:28	48.4216	126.1107	236	20		500	720.6	Yes
170	Jun 20	10:33	48.3888	126.1460	366	19		700	419.7	Yes
171	Jun 20	12:51	48.2562	125.8142	220	19		500	1,324.5	Yes
172	Jun 20	14:33	48.2706	125.7846	180	16		400	953.1	Yes
173	Jun 20	16:13	48.3598	125.6943	141	13		300	151.5	No
174	Jun 20	18:08	48.4684	125.7018	99	14		250	113.4	No
175	Jun 21	07:07	48.7646	125.5863	152	20		350	268.1	Yes
176	Jun 21	09:58	48.4501	125.6030	96	19		250	2,863.4	Yes
177	Jun 21	12:26	48.5961	125.1947	107	20	5.5	250	113.4	Yes
178	Jun 21	13:39	48.6816	125.2305	86	20	6.1	200	277.6	Yes
179	Jun 21	15:18	48.7470	125.3178	95	19		250	218.0	Yes

APPENDIX B: CATCH BY TOW

Species	1	2	3	4	5	6	7	8	9	10
American shad								0.50	0.32	1.14
Arrowtooth flounder	0.62	126.09	137.23	40.22	17.84	25.68	16.42	7.36	3.74	
Aurora rockfish										
Big skate								58.54	12.70	
Bigfin eelpout										
Black eelpout										
Blackbelly eelpout		0.34				0.19	0.38	0.46	0.08	
Bocaccio										
Brown cat shark										
Canary rockfish					45.76	8.80	12.34			
Curlfin sole	2.06									
Darkblotched rockfish										
Dover sole	0.01	19.38	22.88	58.56	36.50	28.78	3.10	4.12	1.92	
English sole	1.23			0.57	0.96			1.46	0.66	
Eulachon		0.36	0.12		0.24	0.86	0.02	1.84	1.06	0.04
Flathead sole		0.84	3.43	1.70	32.44	12.33	0.58	11.84	9.94	
Greenstriped rockfish	0.01				16.40	1.36	2.74	0.48		
Lingcod				1.59	3.14		0.58	1.28	3.60	
Longnose skate		13.22	13.78	4.91	0.70	2.97		8.30	7.92	
Pacific cod	8.82			5.00	5.78		0.74			
Pacific hake	0.41					0.20		1.39	0.84	0.06
Pacific halibut	13.92						7.62	4.36	7.88	
Pacific ocean perch										
Pacific sanddab	3.06							2.12	4.36	0.36
Pacific tomcod								0.04		
Petrale sole	0.01	3.00	0.62	4.12	25.08	2.16	4.32		1.92	
Pygmy rockfish							0.11			
Quillback rockfish	10.68	1.52								
Redbanded rockfish										
Redstripe rockfish					74.58		23.64			
Rex sole	0.09	11.34	21.44	153.05	30.78	41.30	4.70	22.94	19.74	0.48
Rosethorn rockfish										
Rougheye rockfish										
Sablefish		10.46	1.06	0.93			0.62			
Sandpaper skate			0.58		1.02	1.05				
Sharpchin rockfish			0.24	0.03		0.12				0.01
Shortraker rockfish										
Shortspine thornyhead										
Silvergray rockfish										
Slender sole		0.52	0.94	2.07		9.26	0.48	0.80	0.02	
Southern rock sole	5.00									
Spiny dogfish	10.29	86.16	38.45	22.16	4.70	4.34	2.82		1.48	
Splitnose rockfish	1.30									
Spotted ratfish	89.18	15.76	11.69	14.23	9.50	16.27	10.52	22.46	27.90	1.34
Threadfin sculpin							1.36	0.68		
Walleye pollock					0.34			0.16		
Widow rockfish							6.78			
Yelloweye rockfish	0.78									
Yellowmouth rockfish										
Yellowtail rockfish		7.30	5.32	40.37	17.42	18.21	618.16			
Other	7.18	2.64	7.25	2.52	1.76	5.97	1.82	9.26	0.55	0.52
Total	**154.93**	**298.99**	**265.03**	**352.03**	**324.94**	**179.85**	**719.85**	**160.39**	**106.63**	**3.95**

Appendix B continued.

Species	11	12	13	14	15	16	17	18	19	20
American shad	0.50					0.92	0.82			
Arrowtooth flounder	0.08		3.66	154.89	1.85	7.22	15.18	3.54	0.14	6.26
Aurora rockfish										
Big skate										
Bigfin eelpout										
Black eelpout										
Blackbelly eelpout				0.01						
Bocaccio								20.49		
Brown cat shark										
Canary rockfish			2.64			2.40	2.34	2.42		2.70
Curlfin sole	0.46		0.48							
Darkblotched rockfish										
Dover sole	0.40		2.26	83.74	2.20	15.26	6.54	9.98		4.66
English sole	0.20		0.54	22.66	2.25	99.74	21.84	10.30	0.44	1.16
Eulachon				4.06		0.20	0.06			
Flathead sole			4.52	6.04						
Greenstriped rockfish					7.85	7.66	3.04	315.38	8.92	176.24
Lingcod			4.86	4.50	25.60		7.40	13.08	9.32	17.58
Longnose skate			10.26	14.20	1.18					
Pacific cod	0.72		27.04	3.72	18.07	0.40		5.44	2.18	1.13
Pacific hake					0.12			0.72		
Pacific halibut			8.36	5.84	23.03	14.18			33.68	8.87
Pacific ocean perch								0.28		
Pacific sanddab	7.98		2.90		4.20	0.48				
Pacific tomcod					0.07					
Petrale sole	0.46			43.54	10.52	0.78	0.90	0.84	6.02	1.88
Pygmy rockfish							0.10	2.47		2.06
Quillback rockfish	7.56		18.60							
Redbanded rockfish								14.60		
Redstripe rockfish						0.80		382.13		203.72
Rex sole			1.72	37.08	13.84	54.62	37.08	25.70	0.24	0.67
Rosethorn rockfish								3.42		72.74
Rougheye rockfish										
Sablefish				3.22				0.84		
Sandpaper skate							0.68			
Sharpchin rockfish					0.03		2.40	166.29		2.38
Shortraker rockfish										
Shortspine thornyhead										
Silvergray rockfish								8.98		2.35
Slender sole			0.12	3.42	1.82	10.32	0.84			0.17
Southern rock sole	8.18		1.54							
Spiny dogfish			8.10	4.22	9.28	6.26	22.80	367.31	473.56	118.23
Splitnose rockfish										
Spotted ratfish	100.26		282.75	33.58	13.13	12.00	4.32	3.94	0.94	7.06
Threadfin sculpin					7.05	1.44	0.06	0.08	0.28	0.17
Walleye pollock										
Widow rockfish										
Yelloweye rockfish							6.44	37.27		7.70
Yellowmouth rockfish										
Yellowtail rockfish							116.28	156.64	3.50	1.18
Other	0.02		5.42	0.87	0.11	1.28	4.10	0.05	0.24	0.16
Total	**127.12**		**385.77**	**425.59**	**142.20**	**235.96**	**253.22**	**1552.19**	**539.46**	**639.07**

Appendix B continued.

Species	21	22	23	24	25	26	27	28	29	30
American shad							1.68	42.50	0.80	
Arrowtooth flounder	114.46			43.84	50.76		23.70	25.52	45.92	660.30
Aurora rockfish	0.23									
Big skate										
Bigfin eelpout										1.16
Black eelpout	0.20									
Blackbelly eelpout				0.11			11.74	0.12		
Bocaccio		58.40		4.70						
Brown cat shark	0.36									
Canary rockfish		94.65								
Curlfin sole			1.41							
Darkblotched rockfish										15.26
Dover sole	328.90	31.02		69.33	24.60		79.90	123.70	55.44	165.10
English sole		24.34		39.24	0.62		0.20	0.42		1.86
Eulachon				3.56	2.12		1.46	3.72		
Flathead sole				39.96	134.76		177.46	57.22		
Greenstriped rockfish		144.45		0.60					49.36	0.32
Lingcod		20.42	3.86	12.00						
Longnose skate	43.58			9.24	62.96		26.20	38.96	8.90	
Pacific cod		1.92	1.52	2.14				2.54		
Pacific hake	4.79			0.62	0.42		0.64		2.08	50.78
Pacific halibut		5.10	31.42		23.18			13.88	3.92	
Pacific ocean perch									354.70	189.60
Pacific sanddab			4.18	1.48			0.06			
Pacific tomcod										
Petrale sole		8.59	7.49	9.26	43.28					
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish		1.30							34.16	9.84
Redstripe rockfish		1595.83						0.82		
Rex sole	2.24	1.59		139.05	122.54		49.36	118.90	7.60	28.70
Rosethorn rockfish		9.54							4.42	4.96
Rougheye rockfish										17.82
Sablefish	74.94			1.90			1.42	0.98		30.12
Sandpaper skate	1.31	1.22			1.24		0.68	1.02		
Sharpchin rockfish									213.38	
Shortraker rockfish	15.18									
Shortspine thornyhead	19.21								11.88	48.24
Silvergray rockfish		36.80								
Slender sole				8.56	8.76		6.46	1.02	2.88	0.60
Southern rock sole			7.22							
Spiny dogfish		528.02	3.65	12.60	9.86			1.60	8.96	7.82
Splitnose rockfish									330.84	11.48
Spotted ratfish		11.93	16.77	48.16	17.98		70.54	281.77	7.22	4.86
Threadfin sculpin		0.47			0.02				0.60	0.18
Walleye pollock							0.18			
Widow rockfish										1.10
Yelloweye rockfish		15.40								
Yellowmouth rockfish										
Yellowtail rockfish		174.04								
Other	3.08		4.71	8.18	1.82		7.77	3.09	2.00	3.87
Total	**608.48**	**2765.03**	**82.23**	**454.53**	**504.92**		**459.45**	**717.78**	**1145.06**	**1282.91**

Appendix B continued.

Species	31	32	33	34	35	36	37	38	39	40
American shad										
Arrowtooth flounder	721.14	159.02	100.70	1023.34		1212.68	224.64	856.24	0.14	3.54
Aurora rockfish	0.42		2.20							
Big skate									2.18	
Bigfin eelpout	2.18	0.40	1.80	1.82						
Black eelpout	3.14		0.36							
Blackbelly eelpout		0.01								
Bocaccio							3.50	1.02		
Brown cat shark			1.62	0.62						
Canary rockfish						1.50	18.28	1.50		
Curlfin sole									3.36	
Darkblotched rockfish	4.44		4.40	6.05						
Dover sole	310.98	131.54	152.02	97.06		11.16	45.12	48.32	0.16	30.46
English sole	0.30			0.60			60.90	19.94	27.18	65.48
Eulachon									0.03	3.38
Flathead sole										29.32
Greenstriped rockfish		69.48	1.18			13.30	8.74	137.78		
Lingcod		1.52				19.86				
Longnose skate	39.90	0.90	47.66	11.12						8.62
Pacific cod		6.14				1.10	13.36	18.32		10.12
Pacific hake	28.44		3.78	61.72						0.60
Pacific halibut	21.52	4.02		11.58		10.64	22.60	4.50		34.84
Pacific ocean perch	65.30	122.82	45.36	63.84		1.44				
Pacific sanddab									86.70	55.46
Pacific tomcod									11.24	4.88
Petrale sole						7.18	28.00	3.60	1.22	14.60
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish	7.88	2.24	0.54	12.44		5.96		1.86		
Redstripe rockfish								161.00		
Rex sole	12.16	19.96	17.12	25.78		6.16	13.76	39.48	17.22	33.78
Rosethorn rockfish		0.64	0.36	11.16		21.58				
Rougheye rockfish	15.70	4.36	16.40	43.02						
Sablefish	59.40	8.88	34.18	78.74			2.36	5.65		
Sandpaper skate	4.98		3.82	3.34						
Sharpchin rockfish		0.50				271.68				
Shortraker rockfish	5.96		53.32	124.36						
Shortspine thornyhead	25.42	5.62	70.48	183.92		6.08				
Silvergray rockfish		2.18				13.66	6.10	25.48		
Slender sole	0.34	2.22	0.32			0.42	4.36	5.54		
Southern rock sole									8.30	
Spiny dogfish		20.18		5.30		14.10	80.76	131.20	1.84	
Splitnose rockfish		69.38	1.30	91.06		13.78				
Spotted ratfish	3.40	2.78	2.24	11.14		8.70	0.92	5.12	0.88	721.17
Threadfin sculpin						0.02			0.13	
Walleye pollock										0.14
Widow rockfish										
Yelloweye rockfish						6.46				
Yellowmouth rockfish										
Yellowtail rockfish							51.48	6.86		
Other	0.54	5.06	2.26	6.92		4.94	0.38	0.72	14.26	8.20
Total	**1333.54**	**639.85**	**563.42**	**1874.93**		**1652.40**	**585.26**	**1474.13**	**174.84**	**1024.59**

Appendix B continued.

Species	41	42	43	44	45	46	47	48	49	50
American shad	2.44			0.56						
Arrowtooth flounder	5.73	3.56	16.28	106.28	186.66	8.26	173.28	58.24	143.84	9.34
Aurora rockfish						0.66		0.23		
Big skate										
Bigfin eelpout					0.58		0.24		0.56	
Black eelpout						1.10		1.02		
Blackbelly eelpout	4.30			0.26						0.46
Bocaccio										
Brown cat shark						1.08		0.76		
Canary rockfish										
Curlfin sole										
Darkblotched rockfish				1.58			7.21		6.15	
Dover sole	6.00	0.44	3.40	31.94	19.38	42.06	47.81	57.09	39.73	2.94
English sole	40.72	12.16		0.44			0.82			
Eulachon	6.15									1.16
Flathead sole	49.31		0.09	0.36						1.34
Greenstriped rockfish			4.40	3.54	9.78		5.32		0.44	0.38
Lingcod	2.44	13.76		7.16	17.62				2.61	6.88
Longnose skate	18.20		19.34	9.06	6.80	8.42	10.09	11.82	7.62	
Pacific cod			0.68	4.66						0.92
Pacific hake	7.42					1.14		4.42	296.47	0.74
Pacific halibut		4.02		4.04	8.24					14.80
Pacific ocean perch					422.62		21.64		53.94	
Pacific sanddab	51.82	77.40	0.44	0.58						
Pacific tomcod	2.78									
Petrale sole		17.44	2.96	7.84	1.42		2.04			
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish					9.28	1.30	2.00		5.44	
Redstripe rockfish					2.02		1.70			
Rex sole	11.84	37.72	17.60	11.80	5.04	0.88	73.36	7.24	3.18	11.18
Rosethorn rockfish					18.82				0.34	
Rougheye rockfish								8.76		
Sablefish			5.56	7.16		69.70	4.48	27.40	6.84	1.64
Sandpaper skate						1.36		1.20		
Sharpchin rockfish			0.40	0.01	705.05		11.67			
Shortraker rockfish						17.70		8.50		
Shortspine thornyhead					26.92	36.32	0.28	10.43	14.38	
Silvergray rockfish					4.12					
Slender sole	2.38	0.24	5.42	6.54	0.24		2.14		0.89	3.12
Southern rock sole		0.46								
Spiny dogfish		13.82	159.61	185.00	5.36		11.60	4.38	3.98	186.14
Splitnose rockfish					109.49				291.83	
Spotted ratfish	620.18		0.52	1.94	6.48			4.04	3.16	
Threadfin sculpin			0.14	0.74	0.20					0.46
Walleye pollock										
Widow rockfish									1.21	2.06
Yelloweye rockfish					1.20					
Yellowmouth rockfish										
Yellowtail rockfish				53.68	14.30		1.34			9.08
Other	8.33		2.66	1.57	1.89	9.28	8.70	3.38	0.34	1.72
Total	**840.04**	**181.02**	**239.50**	**446.74**	**1583.51**	**199.26**	**385.72**	**208.91**	**882.95**	**254.36**

Appendix B continued.

Species	51	52	53	54	55	56	57	58	59	60
American shad										
Arrowtooth flounder	191.31	92.92	199.42	22.95	190.14	67.02	393.89	10.56	58.84	26.44
Aurora rockfish										
Big skate										
Bigfin eelpout	0.86		1.88	0.30		0.30		2.80	3.52	0.36
Black eelpout			0.51	0.26						
Blackbelly eelpout										
Bocaccio	3.22	3.39			13.98					
Brown cat shark				0.38						
Canary rockfish					17.45		4.78			
Curlfin sole										
Darkblotched rockfish	1.60		27.20	1.22						
Dover sole	16.02	23.66	13.51	76.19	4.43	6.65	12.37	61.82	62.48	64.41
English sole								2.54		7.46
Eulachon										
Flathead sole										
Greenstriped rockfish	9.64	54.04	1.17		34.50	8.72	111.60	1.93		
Lingcod	7.28	10.31			8.49		26.75			
Longnose skate	18.58	16.88	21.04	30.10			29.16	13.56	21.75	21.60
Pacific cod		61.82			15.63		4.92			
Pacific hake			14.56	2.52	0.97			7.47	5.00	3.36
Pacific halibut	5.86	22.05			5.60	10.53	10.30		8.93	
Pacific ocean perch	23.74		342.25	20.38	0.86	346.86	14.44	5.58	16.91	8.23
Pacific sanddab										
Pacific tomcod										
Petrale sole		1.84					0.25			
Pygmy rockfish		0.25					2.30			
Quillback rockfish										
Redbanded rockfish	3.72	0.12	1.04			2.35	0.35	0.84	1.43	1.34
Redstripe rockfish		83.35			184.06	17.16	69.46			
Rex sole	7.02	10.20	4.17	0.56	2.86	0.79	8.30	11.72	31.82	18.96
Rosethorn rockfish	1.82	2.90	0.40		0.94		14.86	0.30		
Rougheye rockfish			1.10	28.88	18.43			29.25	109.25	28.00
Sablefish	15.94		19.46	57.14		2.00		11.29	21.13	41.40
Sandpaper skate	1.10			0.94		1.07			0.94	
Sharpchin rockfish	62.41	1.76			1.85	0.79	16.13			
Shortraker rockfish				16.04						
Shortspine thornyhead	12.86		14.27	18.84		1.68		9.77	6.90	0.89
Silvergray rockfish	1.82	3.78			15.96		35.59			
Slender sole	0.52	2.08	0.01			0.07	0.42			
Southern rock sole										
Spiny dogfish	14.34	16.72	11.88	5.80	54.05	33.50	34.89			
Splitnose rockfish	923.79	18.04	13.50			0.09				
Spotted ratfish	4.62	7.30			1.96	10.18	3.31			
Threadfin sculpin		1.45	0.89		0.97	0.76	0.80		0.15	0.20
Walleye pollock										
Widow rockfish							0.55			
Yelloweye rockfish							8.36			
Yellowmouth rockfish										
Yellowtail rockfish	2.26	3.07			5.42	3.81	14.10			
Other	0.58	0.72	0.15	4.68	1.90	0.19	1.02	0.61	0.37	0.58
Total	**1330.91**	**438.65**	**688.41**	**287.18**	**580.45**	**514.52**	**818.90**	**170.04**	**349.42**	**223.23**

Appendix B continued.

Species	61	62	63	64	65	66	67	68	69	70
American shad		0.91						0.94		
Arrowtooth flounder	3.09	93.27	33.15	2.21		6.60	17.98	3.94	6.68	5.38
Aurora rockfish	0.42									
Big skate										
Bigfin eelpout	0.39									
Black eelpout	0.38									
Blackbelly eelpout						1.27	7.60		0.01	4.14
Bocaccio		3.87	2.28	3.71				2.94		
Brown cat shark	1.54									
Canary rockfish				26.26	14.84			22.08	8.56	8.14
Curlfin sole										
Darkblotched rockfish										
Dover sole	49.51	26.42	31.57	6.82		0.98	0.59	4.76	0.60	1.98
English sole			0.52	2.46		1.19	30.98	84.14		20.86
Eulachon						1.07	0.75			0.84
Flathead sole				0.35		1.31	2.90			1.72
Greenstriped rockfish		23.36	45.95	44.23	2.65			12.32		0.84
Lingcod		2.74		8.98		16.68	23.11		3.30	19.32
Longnose skate	6.78	71.52	6.96	4.13		11.05		7.00	1.36	
Pacific cod		3.73	1.74	5.03		0.21		4.30		2.88
Pacific hake							0.05			
Pacific halibut		7.86	3.50		4.57			4.06		
Pacific ocean perch		460.59	127.37	6.28	0.38					
Pacific sanddab							1.56			0.34
Pacific tomcod							0.21			
Petrale sole						2.19	1.62	1.72	3.10	2.88
Pygmy rockfish			1.76	0.73						
Quillback rockfish										
Redbanded rockfish		3.82	0.14							
Redstripe rockfish			99.37	438.10						
Rex sole	3.97	17.57	121.46	16.81	0.86	34.54	32.04	2.88	3.32	29.26
Rosethorn rockfish		0.79	10.86	4.32						
Rougheye rockfish	19.58									
Sablefish	100.70	5.68	1.09					0.98		
Sandpaper skate	1.13	0.32								
Sharpchin rockfish		80.96	52.58	2.91						
Shortraker rockfish										
Shortspine thornyhead	27.49	1.21								
Silvergray rockfish		6.06	10.37	15.44				2.44		
Slender sole		0.30	1.77	0.43	0.64	3.75	2.04	2.12	1.64	1.56
Southern rock sole										
Spiny dogfish		26.30	28.08	2374.05	6000.00	3.03	11.78	634.44	6.82	
Splitnose rockfish		3 [illegible]	1.36							
Spotted ratfish		4.04	1.61	11.03	0.07	0.85	5.83		2.42	7.66
Threadfin sculpin		0.50	0.67	0.71					0.12	0.12
Walleye pollock			0.36							
Widow rockfish		1.98								
Yelloweye rockfish				47.41						
Yellowmouth rockfish										
Yellowtail rockfish		2.26	23.54	21.71		1.02	0.94	16.92		
Other	1.41	20.63	1.83	2.00		3.49	0.95	0.28	0.02	0.01
Total	**216.39**	**901.76**	**609.89**	**3046.11**	**6024.01**	**89.23**	**140.93**	**808.26**	**37.95**	**107.93**

Appendix B continued.

Species	71	72	73	74	75	76	77	78	79	80
American shad										
Arrowtooth flounder	11.16	5.64	8.93	0.21	19.24	230.56	149.82	7.46	12.80	312.42
Aurora rockfish					1.64					
Big skate										
Bigfin eelpout						4.78	6.12			1.72
Black eelpout					0.44					
Blackbelly eelpout	3.76	0.15								
Bocaccio		3.33	3.18					10.74	5.48	
Brown cat shark					2.74					
Canary rockfish		2.44						20.58	3.58	
Curlfin sole				0.30						
Darkblotched rockfish						8.98	3.34		0.68	3.70
Dover sole	1.82	1.63	0.37		74.94	60.98	62.66	16.58	17.38	53.53
English sole	20.28	15.99	42.24	15.37		3.22		5.46	1.72	
Eulachon	0.96	1.21	1.10	0.04						
Flathead sole	2.64	5.36								
Greenstriped rockfish							0.58	49.28	1.62	
Lingcod	11.32	11.52	8.35				5.76	5.52	5.06	
Longnose skate		5.95	1.59		7.28	6.28		4.98	11.18	0.53
Pacific cod								4.82		
Pacific hake	0.28	0.17			1.48	15.90	1.50			4.40
Pacific halibut		4.04	4.93	3.40		3.28		4.80		6.08
Pacific ocean perch						207.91	90.94	0.74	154.40	55.14
Pacific sanddab	0.52	0.26	44.10	86.86						
Pacific tomcod			0.15	9.40						
Petrale sole	2.58	6.34	14.82	3.29						
Pygmy rockfish								0.22		
Quillback rockfish										
Redbanded rockfish						2.46	2.10	0.42	29.54	6.20
Redstripe rockfish								705.52		
Rex sole	27.66	32.99	29.48	3.07	3.70	20.08	28.38	35.94	38.00	30.64
Rosethorn rockfish						2.94	0.66	7.10	12.10	0.45
Rougheye rockfish					1.68	4.82				8.07
Sablefish					130.08	30.04	2.70	0.78		7.80
Sandpaper skate										
Sharpchin rockfish							0.48	9.14	327.90	7.61
Shortraker rockfish										
Shortspine thornyhead					23.70	22.38	14.04		1.52	27.89
Silvergray rockfish								2.40	2.90	
Slender sole	5.22	2.37	2.24	0.02		2.54	0.20	2.32	0.20	0.33
Southern rock sole				6.28						
Spiny dogfish			1.61		2.16	32.90	18.52	1337.66	35.62	7.52
Splitnose rockfish						182.42	416.60	7.86	177.16	42.41
Spotted ratfish	5.40	1.84	4.32	1.42		8.36	3.80	5.00	2.24	17.45
Threadfin sculpin		0.06	0.04					0.74	0.22	
Walleye pollock										
Widow rockfish										
Yelloweye rockfish								16.12	2.46	
Yellowmouth rockfish									13.80	
Yellowtail rockfish		1627.22	86.82	5.96				4.68	3.22	
Other	0.31		0.34	0.05	2.74	3.74	0.62	1.14	0.76	0.26
Total	**93.91**	**1728.51**	**254.61**	**135.67**	**271.82**	**854.57**	**808.82**	**2268.00**	**861.54**	**594.15**

Appendix B continued.

Species	81	82	83	84	85	86	87	88	89	90
American shad										
Arrowtooth flounder	223.68	429.14	360.74	114.68	160.40	184.76	20.56	18.14	57.88	40.00
Aurora rockfish										
Big skate										
Bigfin eelpout	1.78	1.53	1.60	0.14		1.80		0.80	5.08	0.28
Black eelpout		0.10								
Blackbelly eelpout										
Bocaccio	2.61	3.81		5.82			6.96	7.46		3.61
Brown cat shark										
Canary rockfish								2.52		
Curlfin sole										
Darkblotched rockfish	1.81	0.38	6.02	8.54	2.44	20.68			8.38	
Dover sole	39.95	34.35	29.04	21.68	55.16	121.12	8.30	40.48	54.96	96.41
English sole		2.21		0.56					0.92	
Eulachon										
Flathead sole										
Greenstriped rockfish				2.26			7.82	45.96	9.58	60.34
Lingcod				3.60			5.06	6.14		
Longnose skate			1.30	1.16	0.86	31.54				
Pacific cod								2.70		
Pacific hake		21.68	7.78	0.74	51.34	40.54	2.58		140.06	2.10
Pacific halibut			5.24			3.14	7.48	8.12	23.58	
Pacific ocean perch	76.30	94.64	18.30	96.10	67.76	86.06	31.72	7.22	428.97	36.12
Pacific sanddab										
Pacific tomcod										
Petrale sole										
Pygmy rockfish								1.62		
Quillback rockfish										
Redbanded rockfish	3.77	5.24	6.32	19.38	2.38	18.68	7.24	10.66	9.22	3.21
Redstripe rockfish							81.98	43.48		
Rex sole	24.95	10.64	28.94	24.04	77.66	67.78	22.92	90.30	5.40	18.67
Rosethorn rockfish							0.70	4.54	0.76	9.74
Rougheye rockfish			3.78	1.70	22.14	8.62	0.26			
Sablefish	3.33	10.04	42.66		28.36	6.78	3.68		14.38	6.83
Sandpaper skate					0.94				0.24	
Sharpchin rockfish				12.70			40.58	386.68	9.40	18.59
Shortraker rockfish										
Shortspine thornyhead	10.34	6.86	15.74	5.88	11.50	9.30		2.94	23.33	0.58
Silvergray rockfish							7.92	25.30	3.40	4.88
Slender sole	0.84	0.42	0.26	1.00		0.16		0.48	1.12	0.49
Southern rock sole										
Spiny dogfish	16.86	26.08	3.94			1.58	13.62	14.94	8.98	29.32
Splitnose rockfish	621.94	292.58	13.32	921.24	28.14	14.38		2.24	146.77	15.78
Spotted ratfish	4.20	9.55	9.86	0.62	3.56	2.68	2.74	11.98	3.51	2.15
Threadfin sculpin							0.26	0.20	0.66	1.30
Walleye pollock										
Widow rockfish		1.74		1.10					1.42	
Yelloweye rockfish								1.64		
Yellowmouth rockfish	1.45									
Yellowtail rockfish	1.10	1.66								
Other	0.09	0.86	0.34	0.22	1.82		1.54	3.18	0.32	2.58
Total	**1035.00**	**953.51**	**555.18**	**1243.16**	**514.46**	**619.60**	**273.92**	**739.72**	**958.32**	**352.98**

Appendix B continued.

Species	91	92	93	94	95	96	97	98	99	100
American shad										0.60
Arrowtooth flounder	11.10	8.66	21.76	208.85	47.99	24.31	12.05	2.77	7.34	5.86
Aurora rockfish										
Big skate										
Bigfin eelpout										
Black eelpout										
Blackbelly eelpout		0.36	0.16	0.40	0.25		0.22	0.07	0.66	0.54
Bocaccio		3.20								
Brown cat shark										
Canary rockfish	128.34	163.22	30.38	2.76	5.07	4.67	2.70			3.14
Curlfin sole										
Darkblotched rockfish										
Dover sole	10.20	15.12	64.74	84.48	19.67	3.39	7.06	0.36	1.08	0.98
English sole	0.58		0.84	0.54				14.10	16.61	9.68
Eulachon		0.50			0.08		0.12	0.36	1.20	0.96
Flathead sole				0.40					0.50	0.32
Greenstriped rockfish	6.70	0.80	28.52	8.20	22.01	0.47	0.82			
Lingcod	15.54				18.34		2.64	13.80	6.97	5.14
Longnose skate	14.56	15.40		8.56			0.54			
Pacific cod	6.66	13.48	11.22	2.66	8.64		7.43	0.34	0.36	1.54
Pacific hake			1.78		0.04					
Pacific halibut	15.42			2.60		2.83		6.74	3.42	
Pacific ocean perch				2.06	0.47					
Pacific sanddab								6.40	1.50	
Pacific tomcod										
Petrale sole	32.04	62.82	4.04	1.66		4.46	2.10	6.20	5.08	1.96
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish				0.59						
Redstripe rockfish			3.66							
Rex sole	94.62	88.36	6.10	154.70	47.65	59.57	52.51	18.34	17.96	23.30
Rosethorn rockfish	1.04									
Rougheye rockfish										
Sablefish		0.54	0.84	6.94						
Sandpaper skate										
Sharpchin rockfish				5.87	0.47					
Shortraker rockfish										
Shortspine thornyhead										
Silvergray rockfish			2.10	2.80						
Slender sole	6.78	15.52	2.90	2.20	3.54	2.60	8.34	0.89	2.76	2.98
Southern rock sole										
Spiny dogfish	148.64	222.64	118.14	140.08	268.87	42.47	37.01	46.31	7.81	243.35
Splitnose rockfish				0.18						
Spotted ratfish	7.22	4.48	9.48	2.28	3.93	2.15	1.00	3.98	3.24	1.58
Threadfin sculpin		0.28					0.26			
Walleye pollock										
Widow rockfish										
Yelloweye rockfish										
Yellowmouth rockfish										
Yellowtail rockfish		5.96		9.46	10.55	6.99	2.08			5.60
Other	1.10	2.04	0.68	1.46	1.18	5.76	0.29	0.08		0.62
Total	**500.54**	**623.38**	**307.34**	**649.73**	**458.75**	**159.67**	**137.17**	**120.74**	**76.49**	**308.15**

Appendix B continued.

Species	101	102	103	104	105	106	107	108	109	110
American shad										
Arrowtooth flounder	88.27	79.94	64.39	44.67	15.73	17.48			20.12	787.14
Aurora rockfish										
Big skate										
Bigfin eelpout										
Black eelpout										
Blackbelly eelpout	0.12					1.40			0.26	
Bocaccio	3.60	9.86	5.07	2.34		3.29				5.28
Brown cat shark										
Canary rockfish	2.96		13.34	30.03		1.97	1.86		80.33	13.34
Curlfin sole							2.66	1.52		
Darkblotched rockfish										
Dover sole	5.66	5.49	8.02	16.60	2.66	1.36			1.90	48.38
English sole					62.52	24.96	16.62	14.22	35.82	0.30
Eulachon	0.20	0.65	0.38	0.60					0.20	
Flathead sole	2.68	6.65	5.97			0.88				
Greenstriped rockfish	0.16	0.66	1.39						0.32	15.18
Lingcod	2.62	15.24		12.38	9.25	4.99	24.24	17.74	6.94	35.88
Longnose skate		5.56	4.74	17.34						15.94
Pacific cod	0.24		2.70	25.16		0.91			20.64	
Pacific hake			0.12							
Pacific halibut				9.72	3.73	2.52	5.04	4.12	10.75	
Pacific ocean perch										
Pacific sanddab					10.99	0.22	86.34	57.64		
Pacific tomcod										
Petrale sole	2.08	3.60	13.72	32.18	7.74	5.05	8.12	16.70	38.30	1.16
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish										
Redstripe rockfish										
Rex sole	51.36	80.30	76.62	65.58	59.07	41.49	1.00	0.96	18.86	70.84
Rosethorn rockfish										0.12
Rougheye rockfish										
Sablefish	0.76	5.18	0.90	0.66					1.03	
Sandpaper skate										
Sharpchin rockfish										5.68
Shortraker rockfish										
Shortspine thornyhead										
Silvergray rockfish	3.38									212.66
Slender sole	2.32	2.44	6.08	22.72	1.50	3.13			1.76	0.42
Southern rock sole							1.44	5.42		
Spiny dogfish	15.98	118.00	87.24	92.00	13.29	12.70	6.72		41.60	48.30
Splitnose rockfish										
Spotted ratfish	0.68	2.04	2.92	5.04	6.64	7.28	12.06	6.44	4.80	5.22
Threadfin sculpin										
Walleye pollock						0.31			0.39	
Widow rockfish										
Yelloweye rockfish										
Yellowmouth rockfish										
Yellowtail rockfish	54.07	8.91	31.56	13.80					1.35	7.18
Other	2.78	2.07	3.38	4.32	0.51	0.26	2.98	0.14	1.32	1.12
Total	**239.92**	**346.59**	**328.54**	**395.14**	**193.63**	**130.20**	**169.08**	**124.90**	**286.69**	**1274.14**

Appendix B continued.

Species	111	112	113	114	115	116	117	118	119	120
American shad										
Arrowtooth flounder	1728.84	192.66	27.90	61.18	4.56	0.14			18.32	
Aurora rockfish										
Big skate							6.20			
Bigfin eelpout										
Black eelpout										
Blackbelly eelpout				0.36						
Bocaccio		8.94								
Brown cat shark										
Canary rockfish						2.15			2.89	6.14
Curlfin sole							1.88	0.18		
Darkblotched rockfish										
Dover sole	22.56	3.16	12.18	5.48					5.21	
English sole	0.50		19.52	19.19	46.34	1.17	0.90		1.06	
Eulachon				0.46						
Flathead sole				0.79					2.19	
Greenstriped rockfish	2.66	1.10	0.16			0.31			7.72	
Lingcod	22.72	49.20		4.61	15.98	2.41			16.79	0.80
Longnose skate				8.56					1.38	
Pacific cod			0.68	17.97			0.18			
Pacific hake									0.94	
Pacific halibut	14.76	8.96	6.02	7.76	10.78	15.87	8.22	8.96		
Pacific ocean perch	0.14									
Pacific sanddab				71.56	41.04	0.19	28.92	15.78		0.98
Pacific tomcod										
Petrale sole		0.16	20.62	5.42	6.40	0.52	4.99	1.12	6.07	
Pygmy rockfish										
Quillback rockfish						15.21	1.32			2.64
Redbanded rockfish										
Redstripe rockfish									0.22	
Rex sole	8.86		37.00	23.51	8.62				98.34	
Rosethorn rockfish										
Rougheye rockfish										
Sablefish										
Sandpaper skate										
Sharpchin rockfish									0.16	
Shortraker rockfish										
Shortspine thornyhead										
Silvergray rockfish	10.98	2.56	2.30			0.75			46.24	2.30
Slender sole			1.14	1.11					22.87	
Southern rock sole					2.33	24.68	2.61	4.20		3.68
Spiny dogfish	37.44	9.66	29.30		8.88		0.40		30.16	
Splitnose rockfish										
Spotted ratfish	1.70	0.22	6.82	4.93	6.60	11.15	8.62	3.74	1.04	41.86
Threadfin sculpin										
Walleye pollock			0.12	0.21						
Widow rockfish		12.42								3.65
Yelloweye rockfish						1.86				
Yellowmouth rockfish										
Yellowtail rockfish		26.58								0.68
Other	1.82		1.58	0.34	1.02	2.15	5.14	0.66	3.82	11.08
Total	**1852.98**	**315.62**	**165.34**	**233.44**	**152.55**	**78.56**	**69.38**	**34.64**	**265.42**	**73.81**

Appendix B continued.

Species	121	122	123	124	125	126	127	128	129	130
American shad										
Arrowtooth flounder	41.66	6.90	20.26	45.60	132.20	139.54	80.74	13.66	4.90	267.81
Aurora rockfish										
Big skate										
Bigfin eelpout			0.46	1.78	7.16	1.64				3.73
Black eelpout										
Blackbelly eelpout										
Bocaccio	11.89	9.78	16.40		4.00					
Brown cat shark										
Canary rockfish		47.10	11.58						63.29	
Curlfin sole										
Darkblotched rockfish			1.06	20.78	63.26	13.89				10.41
Dover sole	1.74	0.86	12.36	119.86	109.50	306.54	0.16	15.66	6.62	156.16
English sole	17.46							27.36	4.04	
Eulachon										
Flathead sole										
Greenstriped rockfish	3.63	3.10	7.34				1.14		34.82	
Lingcod	6.89						19.80	5.62	5.44	
Longnose skate				17.68	27.34	18.92	27.70			13.24
Pacific cod	19.54							2.96	0.63	
Pacific hake			20.40	98.42	118.06	54.26				5.48
Pacific halibut	4.13				6.64	5.64		7.82		9.00
Pacific ocean perch			47.74	34.22	156.54	24.34	5.67			134.43
Pacific sanddab	5.99									
Pacific tomcod										
Petrale sole	4.19						1.14	9.92	7.76	
Pygmy rockfish		0.12								
Quillback rockfish										
Redbanded rockfish		23.10	7.80	3.12	12.38	10.20	6.85			11.26
Redstripe rockfish		85.12	0.24							
Rex sole	7.37	3.90	14.12	16.78	11.52	18.02	0.20	55.84	15.84	4.81
Rosethorn rockfish		1.00	0.44		0.30	0.22	1.12			
Rougheye rockfish				67.32	14.50	200.64				2.56
Sablefish	0.96		11.72	64.72	27.92	27.46			0.76	11.49
Sandpaper skate				3.18	2.00	1.26				1.51
Sharpchin rockfish		12.68	21.36				160.74	0.74		
Shortraker rockfish										
Shortspine thornyhead		0.12	54.86	21.64	47.34	28.64	0.20			3.80
Silvergray rockfish	15.49	16.96	55.94	3.54	3.72		82.99	2.00	20.12	3.50
Slender sole	1.54							2.78	1.25	0.22
Southern rock sole										
Spiny dogfish	6.00	4.60	59.68	2.60	11.22	3.22	20.36	4.72	78.98	18.72
Splitnose rockfish			81.09	39.56	421.90	22.84				148.62
Spotted ratfish	2.66	0.16	4.94	5.16	13.26	9.22	0.41	0.10	1.05	0.94
Threadfin sculpin							0.37			0.11
Walleye pollock	2.70							0.42		
Widow rockfish										
Yelloweye rockfish		6.12							3.63	
Yellowmouth rockfish			160.75	1.36						
Yellowtail rockfish	0.86	49.72					2.36			
Other	0.65	2.00	4.84	1.74	0.10	4.66	0.20		2.42	0.29
Total	**155.35**	**273.34**	**615.38**	**569.06**	**1190.86**	**891.15**	**412.15**	**149.60**	**251.55**	**808.09**

Appendix B continued.

Species	131	132	133	134	135	136	137	138	139	140
American shad										
Arrowtooth flounder	23.50	6.21	20.00	48.10	30.20	224.72	19.58	107.14	47.86	59.66
Aurora rockfish					1.88					
Big skate										
Bigfin eelpout						2.02		2.28		
Black eelpout					0.48					
Blackbelly eelpout	0.20		0.20	1.18						
Bocaccio	2.17	3.71	3.80	6.86					4.44	3.46
Brown cat shark										
Canary rockfish	5.84									
Curlfin sole										
Darkblotched rockfish						2.60		1.32		
Dover sole	5.96	0.90	2.45	67.08	152.04	125.98	128.56	36.22	49.58	48.28
English sole		23.21	13.56	0.66				0.84	1.28	2.36
Eulachon	0.34		0.14							
Flathead sole	1.24		0.39	0.24						
Greenstriped rockfish	1.72			10.66	2.52				7.32	45.19
Lingcod		5.33	8.34						8.86	
Longnose skate					5.56	1.26	9.86		22.04	10.40
Pacific cod	0.95								1.08	1.65
Pacific hake				1.44	6.00	6.70	3.78			
Pacific halibut		4.87	5.11			2.68				2.60
Pacific ocean perch	1.18			95.78	15.94	40.62	19.70	342.38	166.60	4.30
Pacific sanddab		1.51	0.29							
Pacific tomcod										
Petrale sole	10.54	4.89	4.90	0.76				0.84		0.50
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish				4.90	5.08	13.78	0.92	6.54	7.42	4.40
Redstripe rockfish									28.90	30.34
Rex sole	53.86	17.11	31.64	160.02	5.64	50.76	23.64	31.72	67.24	179.88
Rosethorn rockfish									0.62	10.09
Rougheye rockfish					3.18	1.28	16.98			
Sablefish				0.62	38.68	39.38	275.50	2.74		0.90
Sandpaper skate										
Sharpchin rockfish				26.06	2.68	0.26		0.86	320.22	172.46
Shortraker rockfish					16.04					
Shortspine thornyhead				0.10	24.56	22.20	34.12	5.08	0.44	
Silvergray rockfish				15.18	1.50				8.30	44.54
Slender sole	9.48	2.80	5.30	0.28		0.80	0.16	0.84	0.22	0.58
Southern rock sole										
Spiny dogfish	45.89	4.78	16.06	13.48		3.92	1.14	18.50	10.22	36.92
Splitnose rockfish				1.24		9.78	0.66	1092.10	119.94	0.39
Spotted ratfish	4.11	14.84	4.07	0.32		5.74	2.98	1.04	2.08	2.90
Threadfin sculpin		0.10	0.12							
Walleye pollock										0.61
Widow rockfish										
Yelloweye rockfish										2.69
Yellowmouth rockfish								1.82	24.30	5.48
Yellowtail rockfish	750.59	24.41	3.60	10.22						136.14
Other		0.20	0.15	7.30	6.50	0.10	2.38	0.32	5.98	1.45
Total	**917.57**	**114.87**	**120.12**	**472.48**	**318.48**	**554.58**	**539.96**	**1652.58**	**904.94**	**808.17**

Appendix B continued.

Species	141	142	143	144	145	146	147	148	149	150
American shad										
Arrowtooth flounder	0.36	1.50	29.78	57.72	108.80	110.66	8407.54	180.44	5.60	11.53
Aurora rockfish										
Big skate					3.52					
Bigfin eelpout										
Black eelpout										
Blackbelly eelpout			0.62	0.60	0.12					0.38
Bocaccio								2.98	4.80	
Brown cat shark										
Canary rockfish									4.20	
Curlfin sole	7.28	6.18								
Darkblotched rockfish					1.82	0.48		2.24		
Dover sole	0.90	0.42	3.72	2.42	4.88	65.38	18.55	23.00	5.00	103.20
English sole	29.62	30.72	6.14					20.26	0.44	0.34
Eulachon			2.38	1.88	0.56					3.92
Flathead sole			9.60	17.74	1.36					64.90
Greenstriped rockfish					0.18	12.78	16.03	16.32	32.00	
Lingcod		1.24	20.24	4.12	17.16		52.24	13.58	25.06	
Longnose skate		3.32		8.82	18.36		32.00	17.96		8.24
Pacific cod										
Pacific hake			0.40							0.58
Pacific halibut	10.14	9.10		3.58	6.20	4.48		4.88	12.88	
Pacific ocean perch								15.14		
Pacific sanddab	103.88	121.02								0.05
Pacific tomcod	4.84	3.04								
Petrale sole	4.26	4.26	3.06			0.54		1.76	0.36	
Pygmy rockfish								2.42	0.24	
Quillback rockfish										
Redbanded rockfish								5.04		
Redstripe rockfish							0.00	0.22	122.98	
Rex sole	8.88	10.52	36.76	29.90	7.54	40.56		52.50	43.27	66.02
Rosethorn rockfish								0.74	3.61	
Rougheye rockfish					0.24					
Sablefish				0.72		0.82	67.92			1.34
Sandpaper skate					0.86					
Sharpchin rockfish								190.10	5.82	
Shortraker rockfish										
Shortspine thornyhead										
Silvergray rockfish								86.48	17.10	
Slender sole			6.66	9.44	1.02	3.90		0.44	0.62	6.46
Southern rock sole	23.74	23.02	0.22							0.20
Spiny dogfish		6.84	22.80	6.82	11.02	18.76	31.44	20.82	31.82	32.36
Splitnose rockfish										
Spotted ratfish	3.22	2.00	6.66	3.02	1.78	4.66		5.44	4.12	73.38
Threadfin sculpin			0.10					0.54	0.44	
Walleye pollock										0.10
Widow rockfish										
Yelloweye rockfish									22.55	
Yellowmouth rockfish										
Yellowtail rockfish							374.24	446.44	2.76	
Other	1.14	0.58	0.12	3.50	7.58	2.78	0.00	1.00	0.40	5.98
Total	**198.26**	**223.76**	**149.26**	**150.28**	**193.00**	**265.80**	**8999.96**	**1110.76**	**346.07**	**378.98**

Appendix B continued.

Species	151	152	153	154	155	156	157	158	159	160
American shad										
Arrowtooth flounder		0.80	16.10	79.10	111.06	73.48	20.36	22.49	30.08	7.82
Aurora rockfish										0.58
Big skate		38.82								
Bigfin eelpout						0.41	2.92	0.63	1.63	0.38
Black eelpout										
Blackbelly eelpout										
Bocaccio				3.58		2.47				
Brown cat shark										1.50
Canary rockfish					2.42	2.14				
Curlfin sole	3.90	0.70								
Darkblotched rockfish					1.96	0.29		1.04	9.64	0.72
Dover sole			0.91	4.23	47.11	86.84	65.04	28.36	49.18	87.92
English sole	41.04		15.70	0.45						
Eulachon		0.18	0.41	1.80						
Flathead sole				0.76	0.74	1.02				
Greenstriped rockfish		0.66		0.19	12.33	9.26		5.27		
Lingcod	3.43	25.84	16.33	1.76						
Longnose skate			7.82	5.40	1.38	6.11	27.82	31.46		
Pacific cod		2.26		0.63						
Pacific hake						1.00	14.40	8.61	7.96	0.76
Pacific halibut	3.79	4.02	5.88						4.92	
Pacific ocean perch						5.33	13.08	62.26	87.38	
Pacific sanddab	51.96	59.17	3.65							
Pacific tomcod										
Petrale sole	0.75	1.24	8.16			0.30				
Pygmy rockfish										
Quillback rockfish		1.70								
Redbanded rockfish					1.88	0.38	0.49	2.74	3.74	
Redstripe rockfish						0.91				
Rex sole	3.53	2.40	23.01	39.51	48.58	64.20	33.68	5.54	8.12	9.22
Rosethorn rockfish								2.78	3.80	
Rougheye rockfish							3.66	3.38	0.22	8.50
Sablefish				5.16	3.24	8.56	46.68	5.74	44.08	32.30
Sandpaper skate										1.30
Sharpchin rockfish								97.38	9.28	
Shortraker rockfish										5.82
Shortspine thornyhead							23.08	12.92	35.88	7.14
Silvergray rockfish										
Slender sole		0.36	2.73	10.53	8.02	9.22	0.70		1.18	
Southern rock sole	47.89	7.14								
Spiny dogfish	16.31	11.48	40.95	257.89	4.02	9.41		1.80	4.06	
Splitnose rockfish							3.50	217.21	83.12	1.22
Spotted ratfish	10.66	2.92	0.59	2.06	2.65	1.62		0.51	2.38	
Threadfin sculpin		0.08		0.11	0.20	0.64				
Walleye pollock		0.24								
Widow rockfish										
Yelloweye rockfish		3.08								
Yellowmouth rockfish								1.87		
Yellowtail rockfish				66.67	14.65	3.29				
Other	9.25	1.12	9.11	0.56	3.40	5.56	0.28	0.46	0.88	0.76
Total	**192.51**	**164.21**	**151.35**	**480.39**	**263.64**	**292.44**	**255.69**	**512.45**	**387.53**	**165.94**

Appendix B continued.

Species	161	162	163	164	165	166	167	168	169	170
American shad										
Arrowtooth flounder	172.56	204.5	118.72	49.22	86.62	73.30			23.90	6.30
Aurora rockfish										
Big skate										
Bigfin eelpout	0.62								0.06	0.32
Black eelpout										0.06
Blackbelly eelpout										
Bocaccio			3.4		3.08	3.10				
Brown cat shark										
Canary rockfish	8.96	3.06	64.87	8.14	94.35	4.40				
Curlfin sole										
Darkblotched rockfish	0.3	0.54							1.62	
Dover sole	48.46	52.88	22.94	12.53	10.52	8.18			14.66	269.92
English sole			5.1	1.52	0.84					
Eulachon										
Flathead sole		1.22	1.06							
Greenstriped rockfish		8.02	0.52	11.43	42.79	76.43			6.18	
Lingcod				9.91	26.36	0.58				
Longnose skate	1.54	1.34	3.96	5.17	4.00				0.86	33.72
Pacific cod	1.04	1.22	12.78		22.58	10.38				
Pacific hake									2.08	3.84
Pacific halibut										
Pacific ocean perch	13.86	1.5				200.50			264.82	41.80
Pacific sanddab										
Pacific tomcod										
Petrale sole	0.56	1.36	2	3.06	2.24					
Pygmy rockfish						0.10				
Quillback rockfish										
Redbanded rockfish			7.16			5.92			8.72	0.66
Redstripe rockfish	1.3					148.62				
Rex sole	48.34	12.9	22.1	11.49	10.24	13.12			5.90	11.92
Rosethorn rockfish				0.50		35.56			1.96	
Rougheye rockfish										25.36
Sablefish	8.04	5.46	6.2	0.96	2.16	6.16			26.78	7.86
Sandpaper skate										
Sharpchin rockfish					0.16	27.00			165.32	7.74
Shortraker rockfish										
Shortspine thornyhead	3.4								12.64	8.16
Silvergray rockfish			2.72		1.00	96.85			4.44	
Slender sole	1.74	4.18	4.56	3.53	1.40	0.38			0.58	0.34
Southern rock sole										
Spiny dogfish	31.34	7.28	1.68		6.02	1.06				
Splitnose rockfish	0.96								179.31	
Spotted ratfish	3.22	1.88	2.28	0.75	1.88	0.90				0.92
Threadfin sculpin		0.3		2.69	2.64	1.48				
Walleye pollock		0.74				0.46				
Widow rockfish										
Yelloweye rockfish				15.93	22.66	12.42				
Yellowmouth rockfish										
Yellowtail rockfish		3.7	5.56	2.01	13.58	1.80				
Other	0.8	1.26	0.58	0.50	6.85	4.60			0.78	0.80
Total	**347.04**	**313.34**	**288.19**	**139.34**	**361.97**	**733.30**			**720.61**	**419.72**

Appendix B continued.

Species	171	172	173	174	175	176	177	178	179
American shad									
Arrowtooth flounder	18.54	31.16	37.33	22.76	31.94	15.36	22.54	6.68	15.33
Aurora rockfish									
Big skate									
Bigfin eelpout	0.16								
Black eelpout									
Blackbelly eelpout									0.09
Bocaccio		0.86	2.92				3.69		
Brown cat shark									
Canary rockfish			2.13	1.74		2.40			
Curlfin sole									
Darkblotched rockfish	33.06	2.52							
Dover sole	26.32	24.20	17.31	5.18	58.60	1.60	21.05	6.74	41.41
English sole	5.18	7.88	11.59	3.96		2.42	1.13	26.02	1.11
Eulachon					3.86				1.00
Flathead sole					20.18		2.47		24.88
Greenstriped rockfish	17.42	66.86	5.24	29.96		31.12			
Lingcod		4.70		3.66			0.52	12.20	2.94
Longnose skate	12.26	19.38			13.08	19.60	6.60	25.74	8.75
Pacific cod		7.38		1.68	10.60	173.40			
Pacific hake	1.04				0.48			0.40	2.42
Pacific halibut				16.44				18.48	7.32
Pacific ocean perch	422.52	651.33	27.30						
Pacific sanddab				3.62	0.40			13.58	5.53
Pacific tomcod									
Petrale sole			0.23		0.88	0.92	3.32	27.22	8.73
Pygmy rockfish			0.67	0.87					
Quillback rockfish									
Redbanded rockfish	0.98		1.67						
Redstripe rockfish		14.72	1.80	4.87					
Rex sole	16.74	12.50	17.19	7.64	69.96	3.70	18.61	7.18	14.74
Rosethorn rockfish	1.18	15.54	0.06	3.28					
Rougheye rockfish	5.74								
Sablefish	2.12	10.76	2.35	2.46		15.63	0.76		
Sandpaper skate	4.76								
Sharpchin rockfish	67.82	43.96	17.29						
Shortraker rockfish									
Shortspine thornyhead	11.00								
Silvergray rockfish		8.82		2.52					
Slender sole	1.46	0.74	0.47	0.82	1.68		5.24	0.94	2.09
Southern rock sole					0.60				
Spiny dogfish		14.96		0.84	11.44	2582.14	18.10	112.94	16.80
Splitnose rockfish	670.98	5.50							
Spotted ratfish	2.52		1.02	0.32	25.24	13.88	7.68	19.08	63.85
Threadfin sculpin	0.08	0.46	0.22	0.26	0.36	0.62			
Walleye pollock							0.38	0.38	
Widow rockfish	2.44					0.42			
Yelloweye rockfish			4.74						
Yellowmouth rockfish									
Yellowtail rockfish		8.40							
Other	0.16	0.48		0.47	18.84	0.20	1.31		1.01
Total	**1324.48**	**953.11**	**151.53**	**113.35**	**268.14**	**2863.41**	**113.40**	**277.58**	**218.00**